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CONTENTS:

	PAGE
Editorial Comment :	
Military Aviation at Home and Abroad	1097
Men of Moment in the World of Flight : Lord Northcliffe	1099
Eddies. By "Oiseau Bleu"	1102
The Caudron Biplane (with scale drawings)	1104
The 1913 Anzani Engines	1108
The Royal Aero Club. Official Notices	1109
From the British Flying Grounds	1110
Notes on the Work of Gordon England, Designer of the latest Bristol Biplane	1114
Week-End Flying at Hendon	1115
British Notes of the Week	1116
Bristol and West of England Aero Club Annual Dinner	1118
Airship and Balloon News	1118
Foreign Aviation News	1119
Models. Edited by V. E. Johnson, M.A.	1122
Model Club Diary and Monthly Reports	1123
Correspondence	1124

EDITORIAL COMMENT.

Military Aviation at Home and Abroad. In many respects the speech delivered by Sir George White, at the annual dinner of the Bristol and West of England Aero Club on the 21st inst., was a remarkable one. In the first place it was remarkable for the story of development he had to tell his audience when speaking of the business enterprise of which he is the head. It is flattering to our national pride to know that, however much we have lagged, industrially, behind our rivals in past years, we have really made up so much of the lost ground as Sir George White assures us we have. And the figures he was able to give his audience were quite sufficient guarantee that he was speaking strictly within the facts, when he said that this country was well up with the rest, so far as the design and the manufacture of the aeroplane is concerned.

It is surely an encouragement when the head of such a concern refers to machines already manufactured and delivered to Russia, Germany, Turkey, Spain, Bulgaria, Roumania, and Italy, and to learn that the latter country has already taken sufficient interest in the type to warrant the establishment there of a factory for their manufacture.

An initial order for some fifty Bristol machines has already been placed by the Italian Government, where the activities of the authorities have been largely stimulated by patriotic financial support. It is not our practice to particularise individual firms when dealing with general progress, but it is a fact that the Bristol Company plays an exceptionally important part in the British aeronautical industry, and it is at least proper to take the measure of their development as a sign and assurance of the scope for increase that lies before those whose means do not as yet, perhaps, permit them to attempt to cover an equally wide field.

When it is put on record by Sir George White that his firm has executed orders during the past year to the amount of £70,000 in value, it should surely give pause for reflection. Such a turnover is no insignificant amount of business. It already assumes dimensions that forecast good dividends to lucky shareholders, and when any sort of business enters this state it is a foregone conclusion that it need no longer suffer from lack of financial support. We draw particular attention to this aspect of the situation, because very recently we had occasion to emphasise a fundamental principle in manufacture which appears to be overlooked in some quarters. Sir George White, be it noted, refers to the prosperity of his company in terms of turnover; the whole tone of his speech implies profit as the result of the magnitude of the business. He does not say that after many arduous months of costly experiment his engineers succeeded in evolving one or two very fine machines that his Sales Department ultimately succeeded in disposing of at a profit. On the contrary the impression is that they have evolved certain types that everybody seems to want and that, as the result of the *number* of orders, they have been able to do a remarkably substantial business.

We consider that it is of the utmost consequence to the flight industry as a whole that this aspect of the matter should be thoroughly appreciated by all. It is not the production of a single special machine that is going to make the money, but the number of orders a firm can secure whether it happens to have a *special* machine or not. We have an interesting case in point in the example of Messrs. Hewlett and Blondeau. Here is a firm who do not at the moment identify themselves with any particular machine, and one of their principal orders on hand is for a number of Hanriot monoplanes, which are being built for the Hanriot Company and are going to be delivered in France.

Now, it is not to be supposed that Messrs. Hewlett

and Blondeau have opened their shops in order to take business at a loss, and equally is it absurd to assume that Messrs. Hanriot have commissioned an English firm to build them copies of their own machines at an exaggerated price. The moral is obvious. Would Messrs. Hewlett and Blondeau get more profit if the machines they were building happened to be called Hewlett or Blondeau instead of Hanriot, and, if so, why? It is, of course, conceivable that such a very special machine might be built as would, for a time, enable a firm to demand a premium on it; but the main point about the name is that it grafts on to itself a goodwill which brings business in quantity. Messrs. Hewlett and Blondeau's name, as reliable constructors, will not, unfortunately, be made known to all and sundry who see the particular Hanriot machines flying which they have constructed. If they had been Hewlett machines, they would be a constant advertisement for the *firm*, and bring them all the more business; but in order that a special machine should be well known, it is first necessary that it should be a design capable of attracting orders on its own merits.

In fine, someone must be employed on the design as distinct from the manufacture. That is where the trained engineer comes in. He may or may not combine the qualities demanded of a works manager and a commercial organiser; if he does he will be all the more valuable, not because he should be expected to carry out all three occupations himself, but because he will better be able to appreciate the problems peculiar to each department. The profit that pays the engineer his salary comes from the number of orders for duplicates that the excellence of his one design serves to attract. Be that one design never so splendid, if it fails to bring orders it fails to bring profit, for it will never be possible to sell commercially the "original one" of any new type.

Look at the Bristol Company, which has given employment to some of the best men in England in every department. Did Sir George White, when he founded his firm, do so because he fancied himself as a designer of aeroplanes? Not at all. He came to the conclusion that his experience of commercial organisation on a large scale might be invaluable to the new industry, and, having the means to carry his ideas into practice, he went ahead on a large scale. There can be no question but that his action stimulated the industrial side of the movement. It was a fine thing, when that firm was founded, to have such a stiffening of the backbone as his support provided. Now comes this little speech of the founder, in which he sums up the business done in a twelve-month at £70,000, and we say again that it is real encouragement. We say that if there is £70,000 worth of business for the Bristol Company, there is £70,000 worth of business for some other company, for even if the business were not going to extend—and anyone who has his eyes open can see that it must extend enormously—there is always that same £70,000 worth of orders that the enterprising business man can try and take from the Bristol Company if he will. Sir George White is far too good a sportsman to do otherwise than feel stimulated himself by the appearance of a determined rival in the field. Knowledge of the good business that his firm is doing ought surely to spur other similarly enterprising warriors of commerce to take a hand in the game. There are plenty of men competent and willing to design and manufacture the machines.

And as for this question of the increase in the field of operations, it can only be as the result of progress in aeroplane design and construction. But it is equally certain that it must follow as a consequence thereof; by

which we mean that, whereas the progressive development of the aeroplane must be the principal cause for the increase in business in the near future, there is no doubt about that increase being forthcoming as the result.

For the moment, the principal source of orders is from those who need machines for war purposes. It is the people who pay the money for the purchase of the aeroplane intended to be used in the defence of their country. The Government merely does the spending. Under the modern *regime* in England the allocation of moneys so spent largely resolves itself into a personal question with the Chancellor of the Exchequer. He knows that he must produce a Budget that will satisfy established essentials, and will not lose the Government its majority. New schemes thus necessarily imply his personal support and the support of the Government, otherwise their introduction would merely be a gratuitous risk with no compensating satisfaction. We trust that the Government as a whole and the Chancellor of the Exchequer in particular is suitably impressed with the need for the adequate finance of aeronautics in England.

We are convinced, and we firmly believe that every right-minded person is convinced, that a wonderful amount has been accomplished with the sum voted last year, exclusive of the amount ear-marked for the acquisition of land. If there exists a body of men who could do more with the same amount than has been accomplished by those in authority over aviation in this country, we should like to see them. They must be doing uncommonly well for themselves in their own concerns.

National aeronautics has already established itself as a department involving essential financial support. But we believe that every Englishman is agreed on the necessity for *extending* the development of the new arm of defence far beyond its present limits, and, therefore, we believe that it is justifiable to regard the demand for more money spent in that department as a demand that has been made in no uncertain voice by the nation at large. More money can very usefully be spent. England is a slow starter, but the Britisher doesn't do so badly when he gets into his stride, and the English world of flight is getting into its stride very nicely just now. One thing that is none too generally appreciated is the fact that the Englishman flies without a gallery. Few people realise, and still fewer fully appreciate, the true significance of the progress already accomplished at the Central Flying School at Upavon and at the Eastchurch headquarters of the Naval Wing, not to mention the work of the fully-qualified pilots who have been the backbone of the Military Wing of the Royal Flying Corps proper.

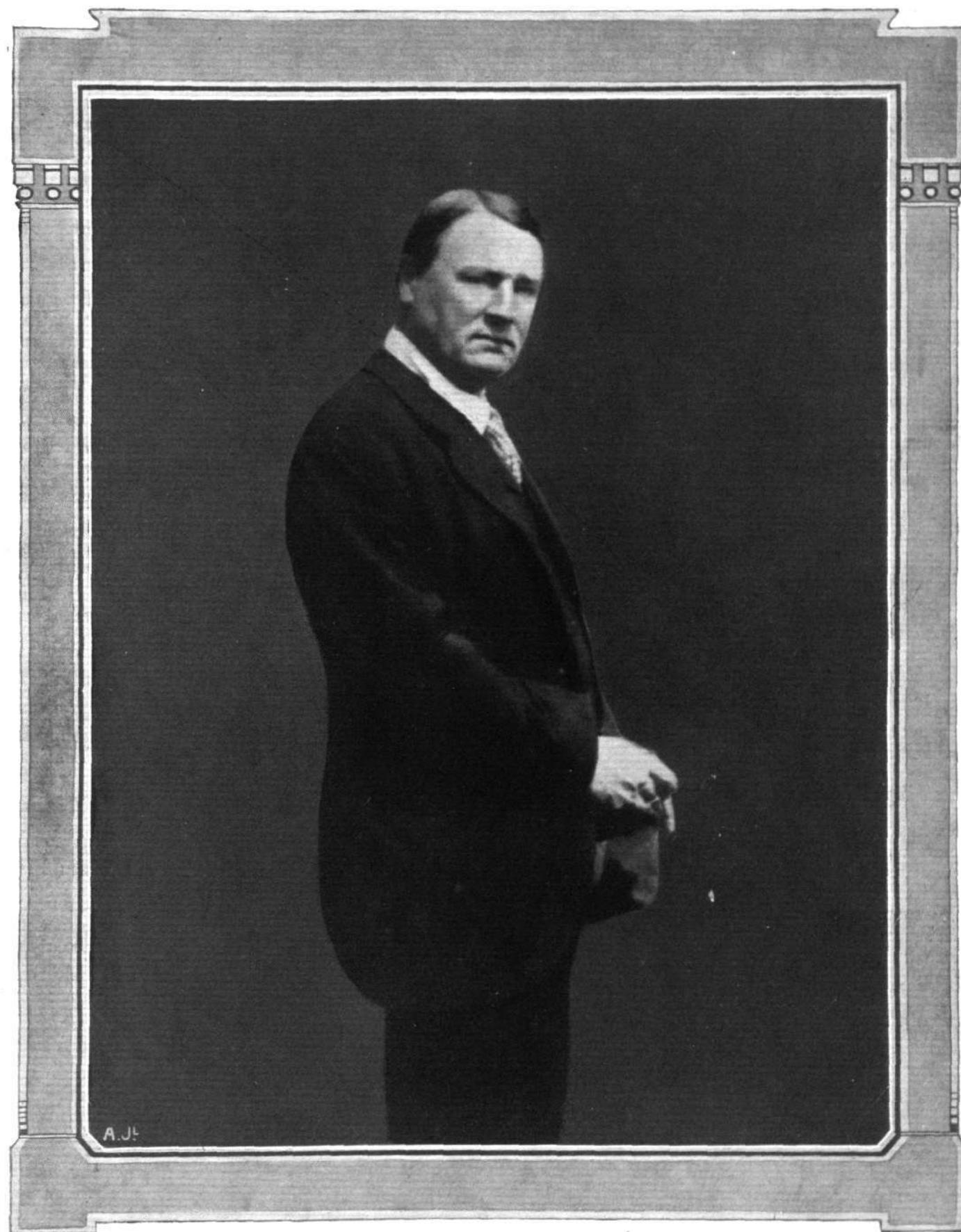
The training of men is in good hands, and is being uncommonly well carried out. The training of mechanics is less extensive than it might be, but that, too, will all come to a proper level in time. Everything in the long run solves itself into a question of *money*. Staff, pilots, mechanics and machines all cost money, and what we want is *more* money.

We speak now from a purely national point of view. We say we want more money because England is a nation that does not possess an aeronautical establishment in keeping with its importance as a Power, having regard to the work done elsewhere, and particularly in France and in Germany, where a great deal more money than we spend has already been devoted to aerial progress. It is not because we think the British Government exists under the onus of spoon-feeding a commercial industry devoted to turning out aeroplanes at a profit

NOVEMBER 30, 1912.

FLIGHT

MEN OF MOMENT IN THE WORLD OF FLIGHT.



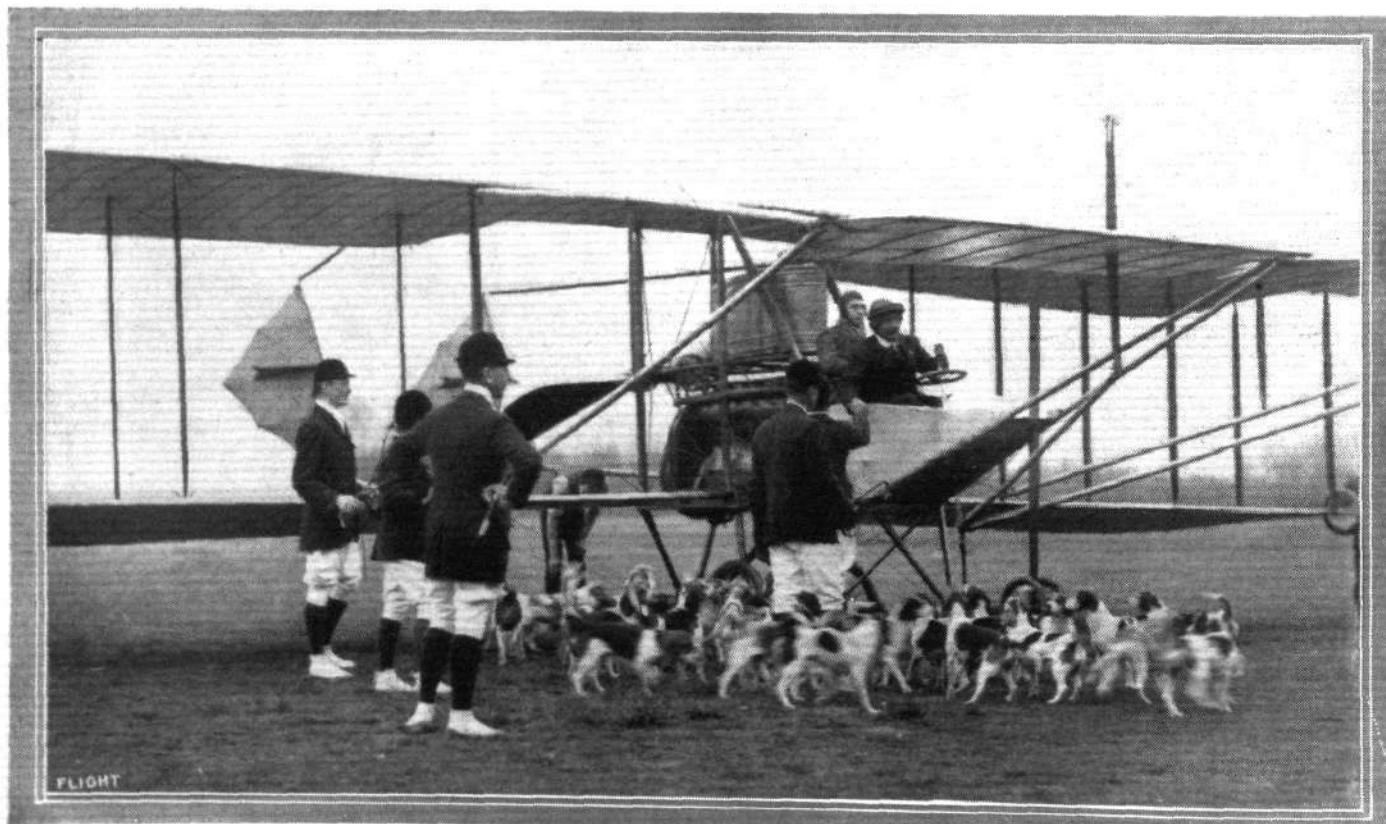
LORD NORTHCLIFFE, who by his vast generosity and great help has done such inestimable good for the cause of aviation in this country.

that we say the Government must devote more money for aeronautics next year. On the contrary, the British Government should have no concern with giving artificial respiration to any sort of industry, aerial or metallic. It is foreign to the national policy, and it is perfectly useless to argue a reversal of established principle in favour of aeronautics. Aeronautics is not the only weakling that would apply for admission to the Government nursery if British home politics once adopted that line of action. There is a very ingenious method of extracting nitrates from the atmosphere that would enable the Government to manufacture explosives from home grown materials, for instance, and the enthusiasts in that line of research might also say that they had just as much claim to preference, especially in view of the supposed state of the ammunition reserves during a certain period of the South African war.

Nor is there any reason why British firms should deny themselves the privilege of profit from abroad out of any idea of patriotism. In this we differ from a point of view apparently adopted by Sir George White in a part of his speech, where he remarked that he at one time offered the Government the exclusive use of his machines, and an undertaking not to build for other countries. The magnitude of his business, and the proportions of his orders from different parts of the world, shows how much his business has benefited by the Government not taking advantage of his offer. If history repeats itself in this matter, as it does in other departments of life, we venture to assert that the Government, and the world of aviation at large, is also benefiting by the experiences of the British and Colonial Aeroplane Company in the many foreign markets that their enterprise has opened to their machines.

Years ago, the French Government prohibited the manufacturers of their guns from supplying other countries, but they learned a severe lesson that taught them that secrecy was a hindrance to progress, and since French cannon have been on the world's markets they have attained to a state of perfection that, so some experts say as the result of the present war, places them first among all the guns in the world. So in the matter of aeroplanes, let our constructors by all means develop to the full extent of their commercial enterprise. It suffices for the national requirements of secrecy that there should be an adequate intelligence department that is competent to keep abreast of the times—perhaps by good fortune and industry to get a little ahead occasionally.

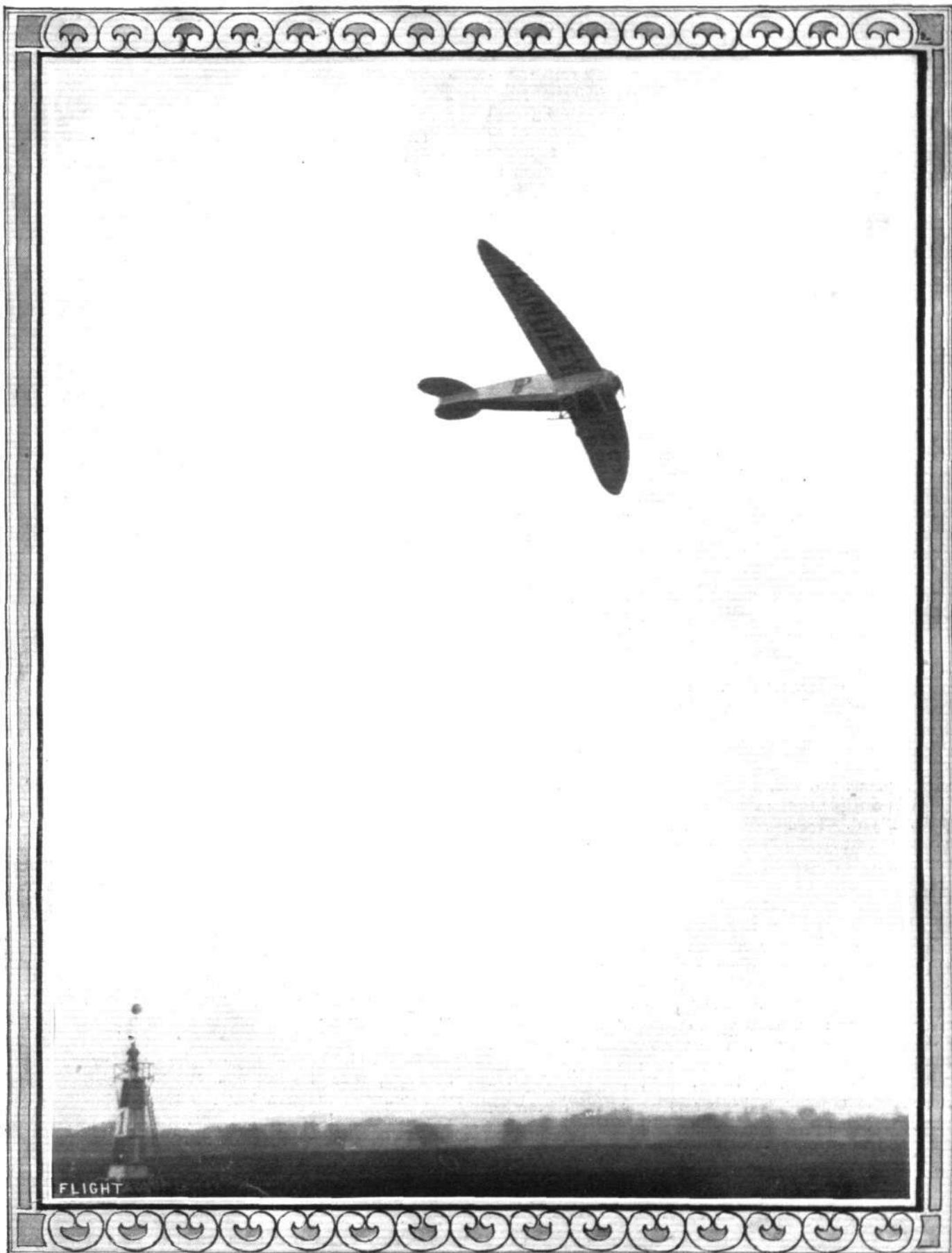
The Government has at least done well to provide itself with an aeronautical "brain" in the services of a number of men who scheme and conduct experiments. Some of the results of this research are kept secret for the supposed benefit of the nation, but for the most part the information that comes to light is of the character that may more profitably be used in the education of others concerned in the work. Incidentally this involves the education of foreigners and Englishmen alike, but the resultant progress is equally for this nation's good. The selection of what is not proper to be published, and of what designs should not be issued in their entirety, must, in any case, be left to the responsibility of someone, and the consequences of the decision, so far as it affects the industry at large, are of very small moment compared with the main point, which is how much money the Government is going to spend on aeronautics next year.



Last week Mr. S. F. Cody made a sporting flight in connection with the Aldershot Beagles at Elmcor Bridge, Laffan's Plain, when he accompanied the meet for a short period after the start. In our picture Mr. Cody is being greeted by the Master, Capt. Sankey, before the start.

NOVEMBER 30, 1912.

FLIGHT



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The graceful Handley Page monoplane in flight at the London Aerodrome last week-end.

EDDIES.

AN aviette club has been formed in France. The first thing they should do, in my humble opinion, is to lay down a definition of what really constitutes an aviette. Perhaps if I take an example we shall arrive at the point more easily. The last aviette prize to be won was gained by Rettich at the Parc des Princes by "flying" over two obstacles, each 10 centimetres high, placed 1 metre apart. I did not see the actual occurrence, but, when in Paris some three weeks back, I saw the next best thing, a reproduction of the whole event on the cinematograph. The machine Rettich used was, to all intents and purposes, a light racing bicycle, to the handlebars of which had been attached a pair of "wings," each about the size and shape of a lacrosse *crosse*. From the construction of them and their size—they could not have been, together, more than five or six square feet in area—it is quite safe to assume that, as far as doing any lift is concerned, they were absolutely useless.

As for Rettich "flying" over the obstacle, he merely rode at full speed up to it, gripped the top tube of the diamond frame with his knees, and vaulted the machine—no more than you or I could do with a little practice on an ordinary push-bike. And yet he was awarded 500 francs for doing it, while those who had really made some sort of attempt at producing a machine which would derive its support from the air, went home having earned nothing, excepting perhaps roars of derision from the crowd. And so I remark, let them define an aviette and formulate rules which will ensure prize money being awarded where it is due.

The British Breguet firm, following the example set by Louis Breguet's Company in France, are devoting some part of their attention to hydro-aeroplanes. But they do not intend to change over to the single-decker type of craft as the French firm have done. Theirs will be a biplane, and will, presumably, be constructed on a similar principle to the standard machine they build for use overland. Details, however, are not yet available, excepting that the floats will in all probability be made of "Durehide," supported by a framework of wood and steel.

"Durehide" is a material for which the British Breguet firm hold the English agency, and which, I should imagine, will prove to them a valuable acquisition on account of its wide application. The material is obtained by treating hide by a chemical process that renders it waterproof and exceedingly tough and wear-resisting. The finished product is, moreover, extremely light compared with butt leather tanned in the ordinary way. Considerable time, too, is saved in the process, for whereas the tanning of leather is a matter of months, "Durehide" is prepared in as many hours. As a material for the manufacture of hydro-aeroplane floats, its natural toughness and flexibility commends it especially.

Congratulations to Mr. R. T. Gates, Manager of the London Aerodrome and Director of the Grahame-White Aviation Co., Ltd., on his rapid recovery from the unpleasant spill he suffered some three weeks since while taking part in the night flying demonstrations at Hendon. He was so badly shaken that it was deemed advisable to

keep him a-bed in his office on the ground till the second day after the smash, when he was driven home in his car. But, somehow or other, he managed to get down to the ground three days later.

The general impression on the ground was "that he would forego taking a practical part in the exhibitions in the future," but the fact remains that he was out and around the aerodrome on No. 5 biplane on Thursday of last week. Mr. Gates has a peculiar knack of calling everyone a sportsman. What is he but one himself?

Congratulations also to Mr. Bernard Isaac, late assistant manager of the London Aerodrome, on his appointment to the Traffic Development Department of the London Electric Railways. To his energies and ability in the science of advertising—it is a science in these days of grace—much of the success of the Hendon ground is due. His new appointment will give him even greater scope than the aerodrome afforded. Again, good luck!

Vedrines has up his sleeve a "stunt" none the less arresting than many he has devised hitherto. His project is to start out early next month for a three months' tour on his Deperdussin monoplane, with the object of covering an average of 125 miles a day throughout the whole of that period.

He has planned to start from Nancy and fly to the "top right hand corner of France"—Calais. From there he intends to follow the coastline the whole way down to Biarritz and then cross, keeping parallel with the Pyrenees, to the Mediterranean coast, calling on his friends at Pau en route. He then proceeds along the French and Italian Riviera to Genoa and down Italy across into Albania and into Athens. From Athens he reckons to commence on the home journey, returning to Paris via Tunis, Constantine, and Algiers. Even there he does not intend to end his journey, for he has resolved to include London in the tour and fly back again to Paris.

If he ever reaches our metropolis, and he will have accomplished no mean performance if he does, let us see to it that he is accorded a respectable welcome.

Last year, when he was the first to arrive of the competitors in the European Circuit there could not have been more than 200 souls, all told, inside the Hendon ground.

Mr. W. H. Ewen has spent the past few weeks up in Scotland, where he has completed negotiations for the re-opening of his school at the Lanark aerodrome, and the erection of works for the construction of Caudron machines.

Interest seems to have begun to awaken in Scotland since he first forsook Lanark, for already, he assures me, he has had applications from half-a-dozen prospective pupils.

Further, he is preparing to open, near Glasgow, an aerodrome where regular week-end exhibitions of flying will be held. And, remember, there is quite a useful £1,000 prize waiting for him if he is the first to fly from Edinburgh to Glasgow on a Scottish-built machine.

Ewen's organisation has been considerably strengthened by his being joined by Lewis Turner, who has made such a fine reputation for himself as a pilot at Hendon. Turner is at present up in Edinburgh flying the 35-h.p. Anzani-engined Caudron biplane that Ewen recently supplied to the order of Mr. Wilson, of the *Edinburgh Evening News*.

Another of our well-known aviators has renounced his bachelor freedom, for on Tuesday of last week Mr. C. H. Pixton, who was the first pupil of the Avro school, and who, since that time, has done such exceedingly sound work for the Bristol Company, was married. I am sure our readers wish them all the happiness the world can give. They left the same day for their honeymoon which is being spent in England, and will be completed in Italy, where Mr. Pixton will have charge of an important commission on behalf of the British and Colonial Aeroplane Co.

Some few months back I mentioned in these paragraphs that Messrs. Wheatley and Sidney V. Sippe were conducting experiments on a device intended to be fitted to a motor car, by which, no matter in what direction the car was driven, its location at any moment would be indicated on a roller map contained in the apparatus. They further intended applying the same invention to steamships and to aeroplanes, examples of locomotion in which the velocity of the vehicle relative to earth cannot be determined in such a ready way as it can be from the road wheels of a car. How far they have proceeded with the device since that time I have not heard. I mention this because I have heard from a friend of mine, in Germany, that a Bremen engineer, of the name of Weller, has produced a similar device for aeroplanes, whereby the pilot of the machine so equipped will be able to undertake reconnaissance flights at night time, and be sure of returning safely to his dépôt. A large sum is said to have been offered by the German Minister of War for this important invention.

Mr. Wheatley has, by the way, control of the Science Department of Epsom College, and I can assure my readers that he is no mean exponent of his profession. Some little while back, while chatting over things in general, he mentioned that he was about to commence on a series of experiments to determine the possibility of recording sound vibrations, through the medium of light, on a cinematograph film, and further, of reproducing them. For such a system, were it practicable, there would be a far-reaching future, for by its use it would be possible, in conjunction with a cinematograph, to reproduce an exact portrayal of an event, perfectly synchronised in the impressions it would convey to the eye and ear. A clever idea, forsooth.

How enterprising and enthusiastic are the French as a nation over their aviation. And this not only applies to the man in the street, but to the constructor himself. As an example, take the generosity that M. Armand Deperdussin has shown in placing at the disposal of the French Aero Club his private aerodrome and hangars at Rheims for the holding of the Gordon-Bennett Cup race in 1913, and contributing a sum of £4,000 towards the expenses of that event.

Among the list of those to whom the Royal Aero Club granted pilots' certificates at their last meeting may be remarked the name of Prince Serge Cantacuzene, who has thus emerged from the novitiate stage that he has

been undergoing at the Bristol Schools at Brooklands and Salisbury Plain. It bears an added interest for the fact that the Roumanian prince has intentions of carrying out, and is, at the moment, preparing to start on a long flight across Europe, from Salisbury Plain to Bucharest. He will attempt the flight, accompanied by a passenger, on a Bristol monoplane. A car carrying spare parts will follow the flight throughout, and will be driven by Mr. Crossman, well known in the motoring world.

Since last week the new Burga monoplane at Shoreham has been undergoing its preliminary tests. It has proved very fast, and from the extremely short run that it takes before leaving the ground, it seems that the specially shaped wings are, in practical test, giving the efficiency that they exhibited when tested in miniature in the laboratory. The peculiar rudders above and below the fuselage that our last week's photograph showed are only a temporary measure for obtaining stability, for a device will be embodied in the design whereby stability will be controlled automatically.

Such strides has the cause of the hydro-aeroplane made during the past season that it is being thought necessary to establish a separate *brevet* for water-flying. The French Aero Club were the first to draw attention to this necessity and they, supported by the British Aero Club, are requesting that a special conference of the Fédération Aéronautique Internationale be called in Paris in the beginning of the new year to discuss this point and also the advisability of establishing an international system of triptyques by which the passage of aircraft from one country to another may be facilitated.

It is now a goodly number of weeks since the War Office decreed that the monoplane should be "suspended," for the time being, from being used by members of the Royal Flying Corps. In conversation with the manager of one of our chief monoplane firms, I learnt that, in consequence, there had been, for obvious reasons, a decided falling off in the number of pupils he had enrolled for tuition in his school of late. However, the suspense should soon be over now, for I've heard from a reliable source that a report is shortly to be issued, and that it will be favourable to the single-spread machine.

There has lately been flying in Germany an extraordinary biplane that by all known laws of aerodynamics ought not to fly. Its *cellule* flies end on, and, so reports say, very nicely and steadily, too, thanks very much. Our theorists, who have spent, perhaps, several years of their lives arriving at the decision that such an aerofoil can't fly, are now faced with the awful prospect of spending several more proving that it can.

Apropos of the recent aeroplane elopement in Indiana, the *Newark (N.J.) News* makes the following remarks on what it terms "the new social institution"—

"The aeroplane wedding solves the problem of the get-away."

"It is not possible for them to throw high enough to blacken the bridegroom's eyes with old shoes. The newly-wedded pair are, in fact, in a position to bombard the wedding guests if they so desire."

"A five-pound boot dropped on a wedding guest from a height of 250 feet ought to bring him a tremendous amount of good luck, according to the traditions of wedding festivity."

"But airship honeymoons are as sure to come to an end as the other kind. In a careless moment the bridegroom will say:

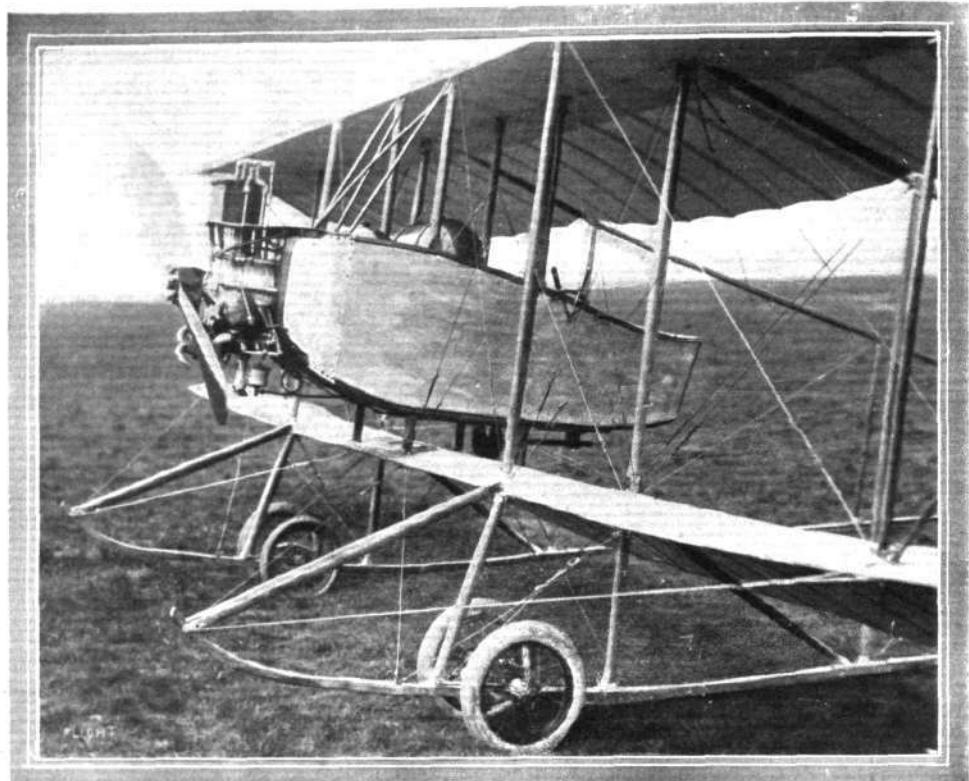
"You do very nicely at the levers, my dear, but your figure eights are nothing like mother used to make."

"Aeroplane marriages are highly dangerous perhaps, but all kinds are, for that matter."

"OISEAU BLEU."

THE CAUDRON BIPLANE.

IT is difficult sometimes to follow with quite the closeness that one could wish the line of thought that the designer has pursued in the evolution of the latest product of his brain. But with a machine like the Caudron there is at least the inspiration of an unusual appearance to stir the mind's curiosity to the point of inquiry. You look, for example, at one of those little biplanes that has been doing such good service in the Ewen School at Hendon, and you observe that peculiar little coracle-like body that is so curtailed by comparison with the corresponding member of the ordinary tractor-driven machine. It is at once a point of interest, and one is impelled to ask, why is it built as it is? Its mere presence is a clear indication that the designer appreciates the advantage of protecting the pilot and also of stream-lining his body as a means of reducing head resistance. The reason for curtailing the extension that ordinarily forms the backbone to such machines, however, may be due either to one of two causes, either the designer has a prejudice against the



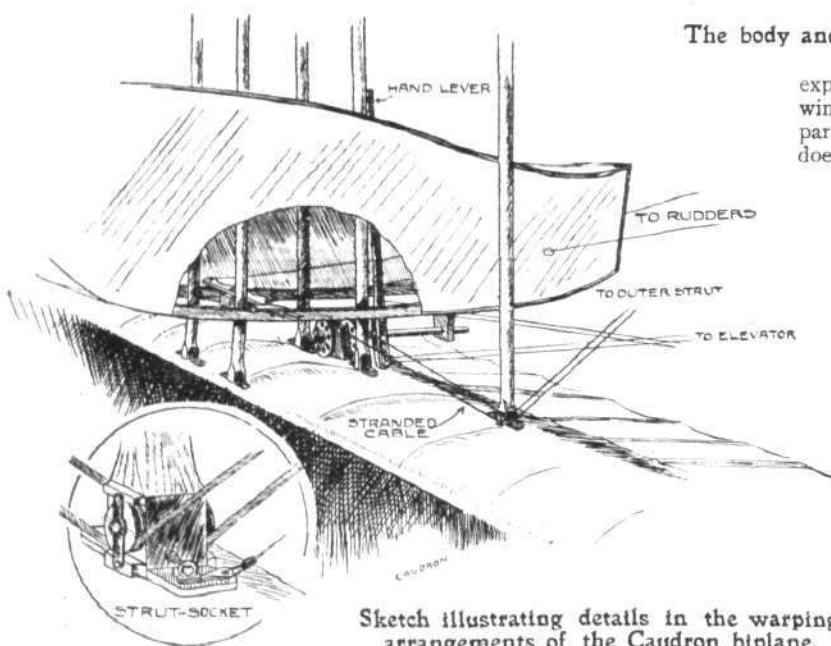
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The body and undercarriage of the Caudron biplane.

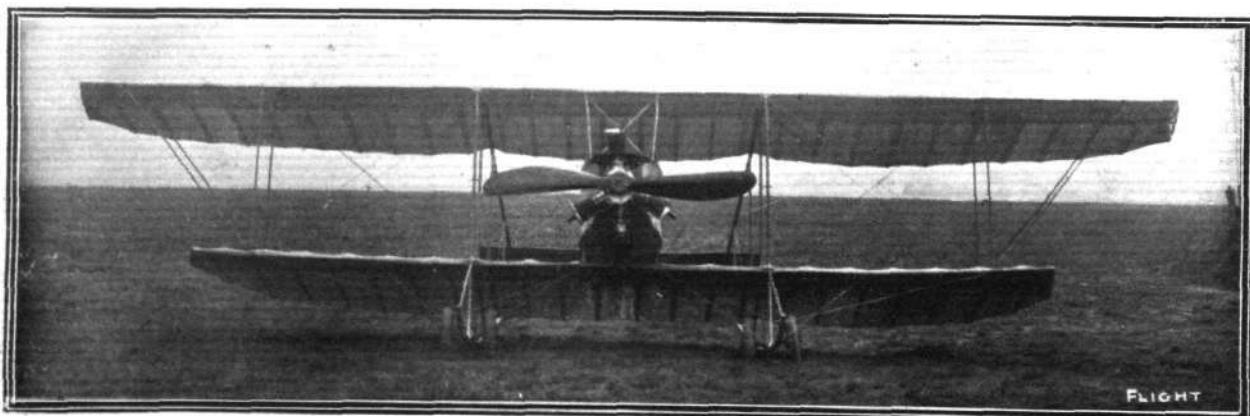
exposure of a backbone, and particularly a surfaced backbone, to the wind, or the reason may be found in the desire to demonstrate some particular principle in connection with the tail of the machine, which does not lend itself so well to the backbone type.

In the Caudron biplane, this latter assumption is more reasonable because the tail is quite one of the most interesting features of its construction at the same time that it is also one of the most simple. The tail of the machine is large; it spans 10 ft. and has a chord of 5 ft. 3 ins. More important than this is the fact that it is designed to warp in unison with the main planes for the purpose of lateral control, and the warping arrangements are facilitated by the outrigger type of support, by means of which the tail-member in the Caudron biplane is attached to the forward part of that machine.

Glancing for a moment at the composite page of sketches that accompany this article, the drawing (5) in the centre thereof illustrates the simple vertical lever that is arranged in front of the pilot, and by means of which he controls the machine in flight. Moving the lever to the left or to the right from its neutral vertical position rocks a shaft that carries the main wing warping-wires attached to it by means of quadrants illustrated in an adjacent sketch (4). At the same time that the handle of the lever moves over, say to the right, the lower extremity of the lever, which projects below



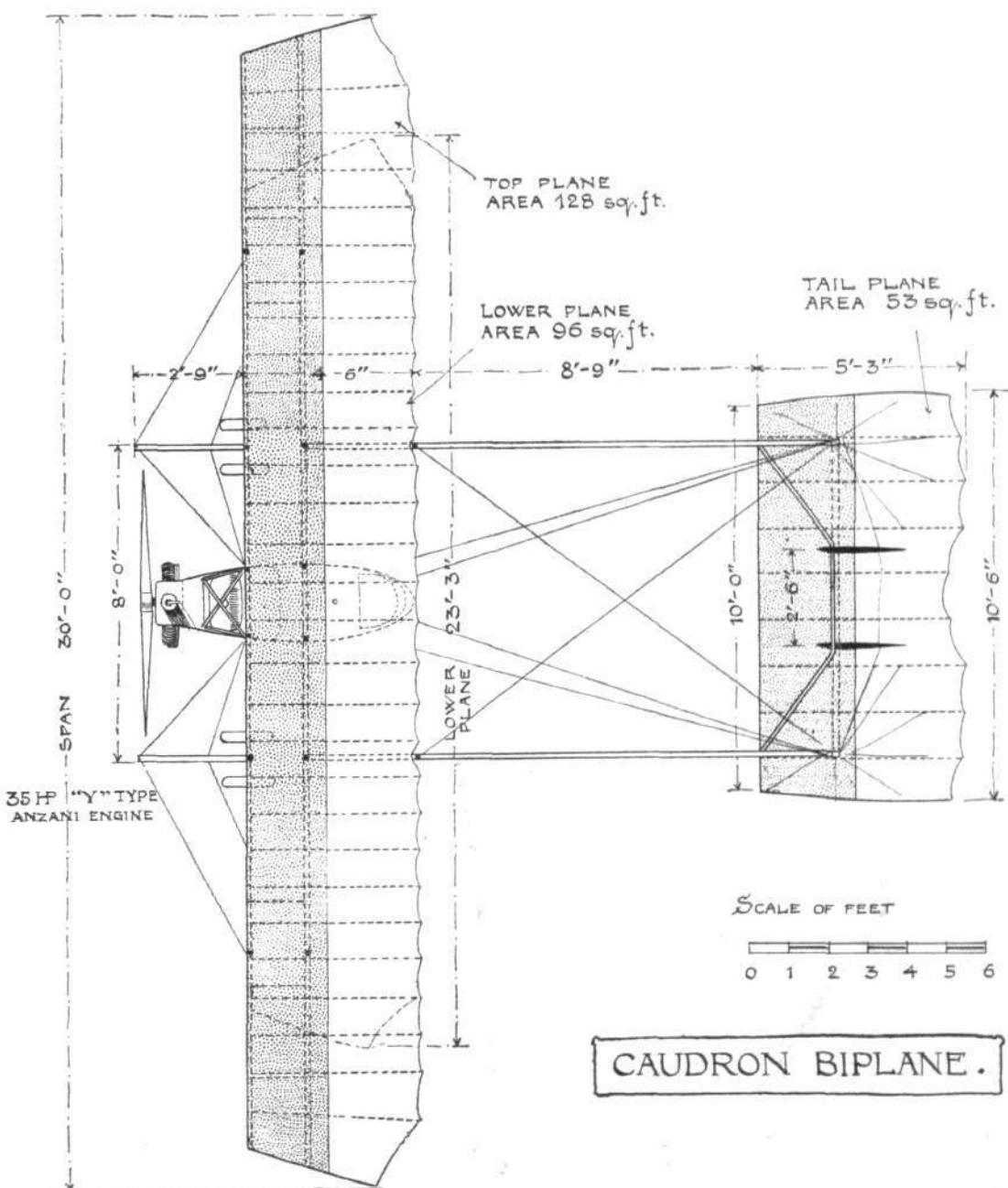
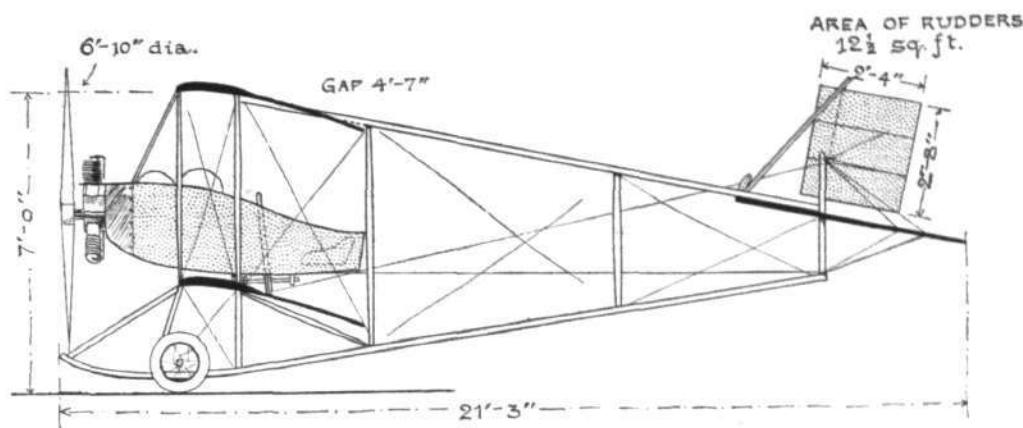
Sketch illustrating details in the warping arrangements of the Caudron biplane.



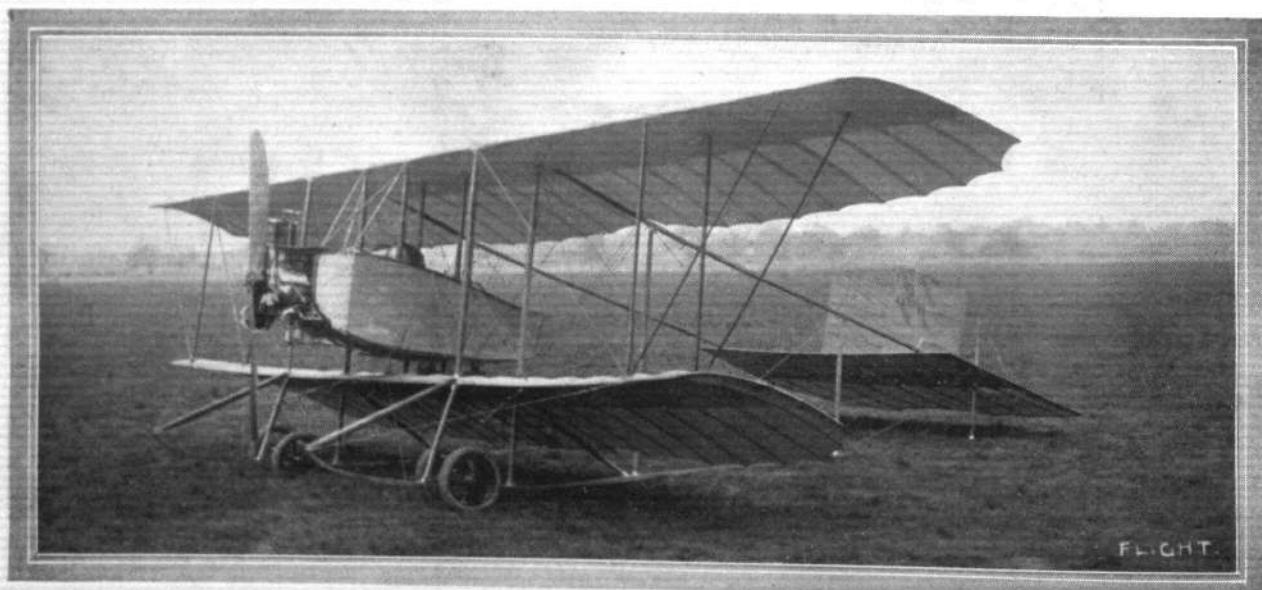
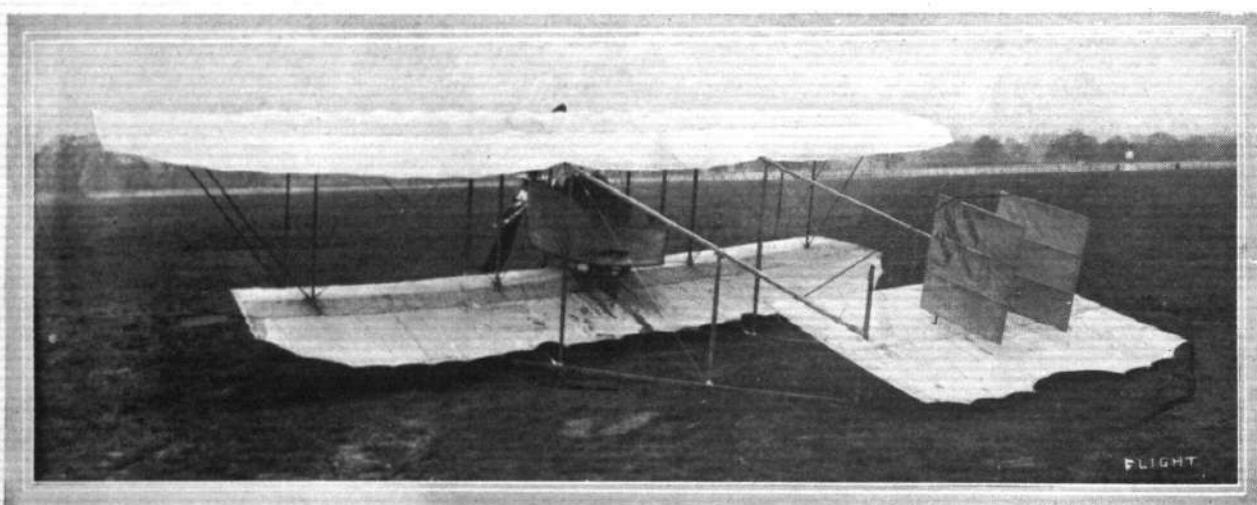
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Front view of the Caudron biplane.

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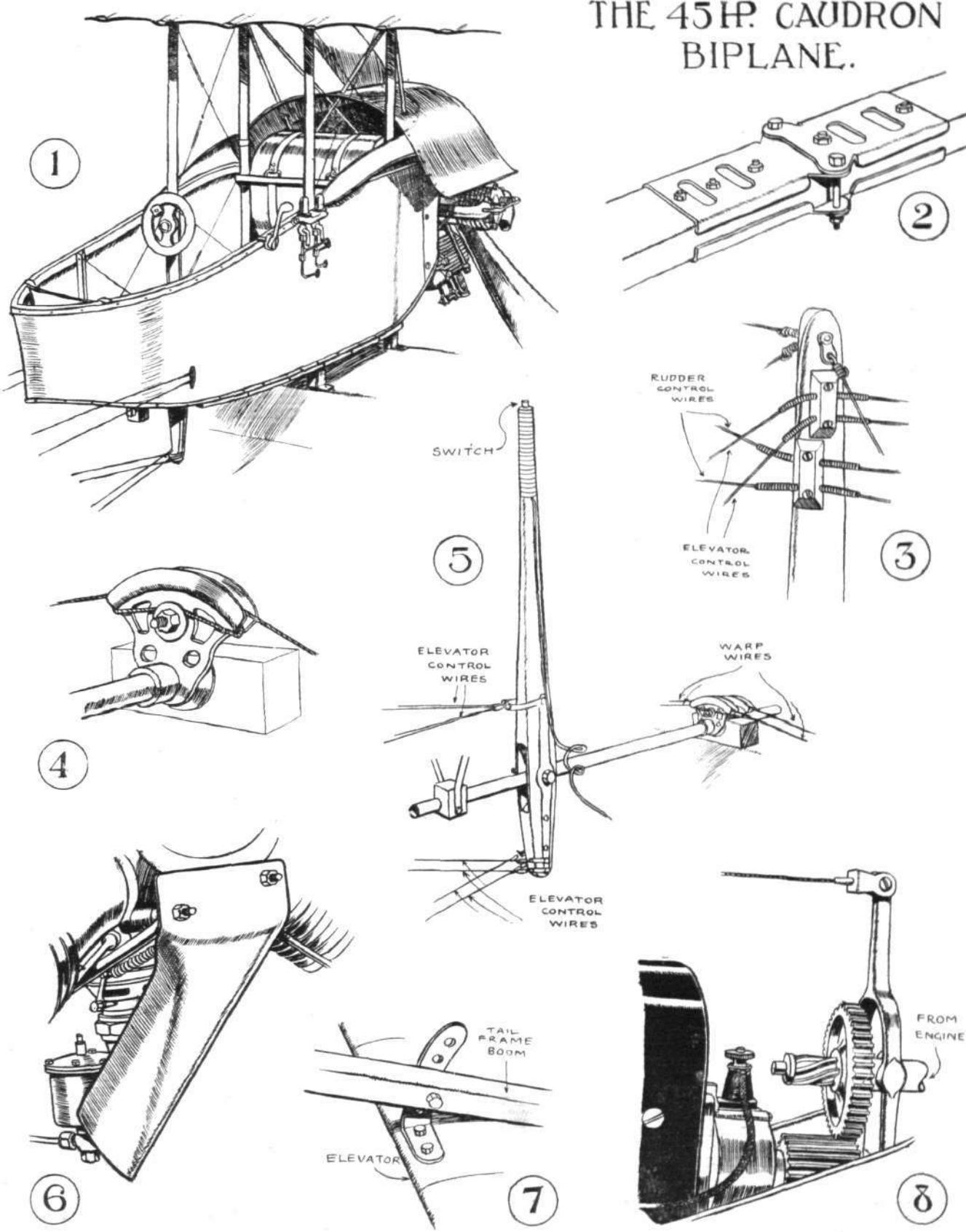
Elevation and plan to scale of the Caudron biplane.



Side view, rear view, and general view from in front of the Caudron biplane.
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THE 45HP CAUDRON BIPLANE.



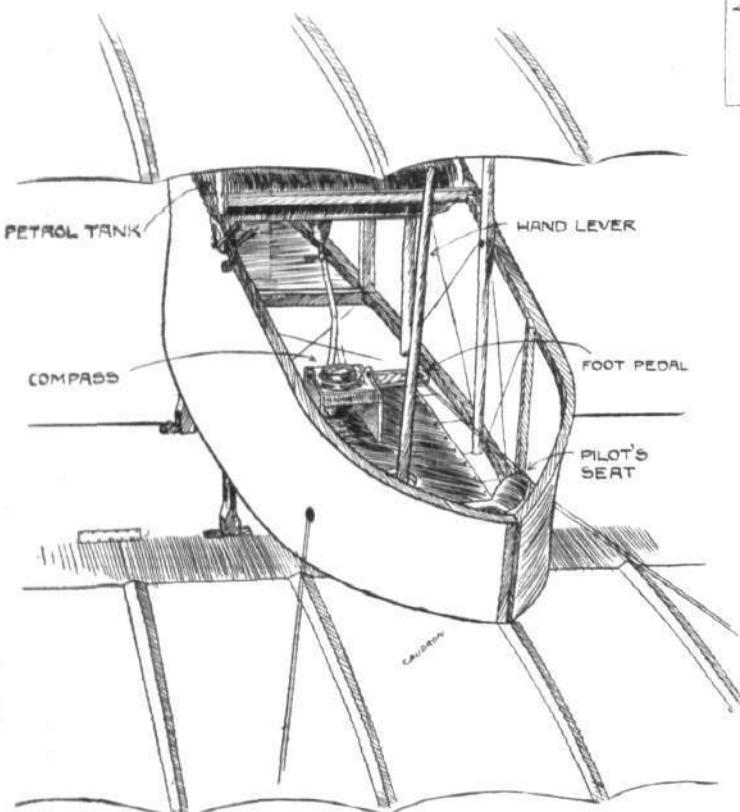
SKETCHES ILLUSTRATING DETAIL CONSTRUCTION IN THE CAUDRON BIPLANE.—1. The cockpit, containing the pilot's seat, control gear, and petrol tank. 2. Method of fastening the tail outrigger booms by detachable joints that facilitate dismantling for transport. 3. Method of attaching the control wires to the masts over the tail by means of flexible guide tubes. 4. Method of attaching the warping wires to the control shaft. 5. The control lever and its attachments. 6. Wind shield to protect the carburettor from the propeller draught, which otherwise tends to promote freezing. 7. Method of adjusting the angle of incidence of the tail plane. 8. Method of timing the ignition by sliding a gear-wheel on a spiral key.

the shaft, moves over to the left, and the wires that are attached thereto pass rearwards to the tops of a pair of upright masts that stand at each end of the transverse boom running through the middle of the tail plane. The wires are guided through flexible tubes attached to the mast-heads in the simple manner illustrated in another sketch (3), and terminate by attachment to the flexible trailing-edge of the tail.

When the lever is moved over as mentioned, the lateral displacement of its lower extremity tends to slacken the wires leading to one of the tail-masts and to pull the others taut. In this way one corner of the tail plane warps upwards while the other is deflected downwards; and the action is positive in both respects, because, as another glance at Fig. 5 will show, there is another set of wires running from a higher point on the lever to the underside of the tail plane for this purpose.

These same wires, which are used in the above described manner for warping the tail for lateral balance—in which action the movement of the tail harmonises with the movement of the main wings—also serve to flex the trailing edge of the tail plane upwards and downwards as a whole when it is to be used as an elevator. This action is accomplished by moving the control lever to and fro in the usual way.

Speaking of the flexing of the tail plane naturally attracts attention to the peculiar construction of the plane itself, which is similar, except for an absence of permanent camber in the ribs, to the construction of the main wings. The peculiarity lies in the

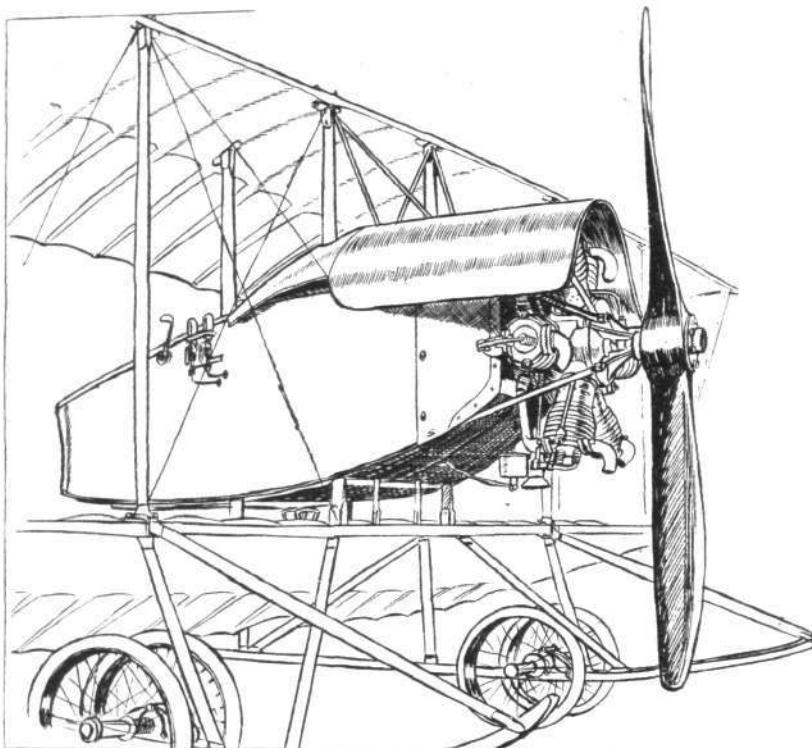


"Flight" Copyright.
Sketch illustrating the interior of the cockpit on the Caudron biplane.

extent of the trailing edge, which is a little more than one half of the chord in length. As a consequence of this, the main spars are unusually close together, but that portion of the planes which lies between the main spars is of the orthodox rigid construction and is double surfaced. The long trailing edge has its flexible ash ribs enclosed in pockets that are sewn on to a single thickness of fabric.

This combination is extremely interesting, and indeed the machine in every respect deserves study, as the illustrations of it that we reproduce herewith very clearly show.

It is significant of what a remarkably efficient machine the 35-h.p. Anzani-Caudron biplane is, for it has been found that it can fly quite well, even if the motor is only firing on two of its three cylinders. With the motor developing its full power, it can lift a passenger, as Rene Caudron demonstrated when his first biplane came to Hendon. M. Caudron himself can be of no mean weight, and the fact that his passenger sat outside on the *cellule* did not render the test any too easy to accomplish.



Sketch illustrating the body and undercarriage of the Caudron biplane.

The two-seater Caudron biplane is almost identical with the 35-h.p. single-seater, both as regards its dimensions and its details. It has, however, the difference that its *nacelle* is designed for two, and that a more powerful motor—a 60-h.p. Anzani—is fitted.



THE 1913 ANZANI ENGINES.

PARTICULARS and prices of the Anzani engines for 1913 have been sent to us by The General Aviation Contractors, Ltd., of 30, Regent Street, S.W., and the essential details are comprised in the following table. It will be noticed that there is one three cylinder Y type developing 25-30-h.p., two six-cylinder models and two ten-cylinder models. The range of powers is extensive; the most powerful type is rated at 100-110-h.p. All have Zenith carburettors and the normal speed is 1,200, except in the case of the largest model, which runs at 1,100 r.p.m.

Reference No. ...	601	606	604	607	608
No. of cylinders ...	3-cyl. Y	6-cyl.	6-cyl.	10-cyl.	10-cyl.
Power developed in h.p. ...	25-30	40-45	50-60	70-75	100-110
Bore, in mm. ...	105	90	105	90	105
Stroke, in mm. ...	120	120	120	125	140
Angle between cylinders ...	120°	60°	60°	36°	36°
Carburettor ...	Zenith	Zenith	Zenith	Zenith	Zenith
Revs. per minute ...	1,200	1,200	1,200	1,200	1,100
Weight complete, in lbs. ...	121	154	200	238	308
Price complete, with magneto	£172	£300	£372	£500	£600



Switzerland has 31 Pilots.

THE Aero Club of Switzerland has now issued 31 pilots' certificates, eight having been granted this year, all to pupils who have qualified out of the country. They include Ed. Baumann, of the Ewen school, at Hendon; E. L. Gassler, of the Eastbourne school; and four trained in France and two in Germany.

German Post Office and "aviation."

THE German Imperial postal authorities are taking a keen interest in aviation matters, and have given every facility to Telegraph-Assistant W. Lenk, who, after a short period of instruction at the German Aircraft Works at Leipzig, qualified as a pilot on November 7th on a Mars biplane. In order that he may thoroughly acquaint himself with the whole art of aviation, the Postal authorities have granted the aviator leave of absence until March 1st next, and in the meantime they are considering the possibility of introducing aerial posts into the German African colonies.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 26th inst., when there were present:—Sir Charles D. Rose, Bart., M.P., in the Chair, Col. J. E. Capper, C.B., R.E., Mr. G. B. Cockburn, Col. H. C. L. Holden, C.B., F.R.S., Mr. F. K. McClean, Mr. C. F. Pollock, Mr. A. Mortimer Singer, Mr. R. W. Wallace, K.C., and the Secretary.

New Members.—The following new members were elected:—
E. H. Durell Barnes, Leonard Bate, Lieut. Hon. J. D. Boyle, T. D. L. Brotherstone, Capt. George H. Errington, Lieut. R. H. Ferguson, Capt. H. W. O'C. Hewett, Sub-Lieut. G. W. W. Hooper, C. S. Leaf, Cecil E. Leigh, 2nd Lieut. A. Shekleton, and Lieut. W. R. Styles. Total membership to date, 1,479.

Aviators' Certificates.—The following Aviators' Certificates were granted:—

- 366. Lieut. Colin George MacArthur, R.N. (Bristol biplane, Bristol School, Salisbury Plain).
- 367. Prince Serge Cantacuzene (Bristol monoplane, Bristol School, Salisbury Plain).
- 368. John Alcock (Farman biplane, Ducrocq School, Brooklands).
- 369. Lieut. Arthur Henry Leslie Soames (3rd K.O. Hussars) (Vickers monoplane, Vickers School, Brooklands).

Letter from the Aero Club de France of November 12th, 1912, requesting the Club to give its sanction to the issuing of Aviators' Certificates to Mr. Ernest Frederic Unwin and Mr. Clive Harold Voss, was considered, and the necessary permission granted.

Public Safety and Accidents Investigation Committee.

A meeting of the Public Safety and Accidents Investigation Committee was held on Monday, the 25th inst., when there were present:—Col. H. C. L. Holden, C.B., F.R.S., in the Chair, Mr. A. E. Berriman, Mr. G. B. Cockburn, Mr. W. O. Manning, Maj.-Gen. R. M. Ruck, C.B., R.E., and the Secretary.

Official Representatives.—The following official representatives were appointed:—

Eastbourne.—Capt. Harold Danvers, Mr. Langley Ellis and Mr. Walter Wood.

Hitchin Accident.—The committee resumed its investigation into this accident and the matter was deferred pending further information.

Belfast Accident.—The reports on the fatal accident to Mr. H. J. D. Astley at Belfast were considered, and it was decided to invite certain witnesses to give evidence at the next meeting, to be held on December 3rd, 1912.

Lieut. W. Parke's Dive at Salisbury Plain.—The Committee having received communications from other aviators who have met with similar experiences to that of Lieut. Parke, it was decided to immediately approach the Advisory Committee for Aeronautics with a view to obtaining their co-operation and assistance in carrying out experiments at the National Physical Laboratory to elucidate the important principles involved.

ROYAL FLYING CORPS.

THE following appointments were announced in the *London Gazette* of the 22nd inst.:—

Establishment. Royal Flying Corps. Military Wing.—Major John F. A. Higgins, D.S.O., Royal Artillery, to be a Flight Commander. Dated October 28th, 1912.

Lieut. John D. Mackworth, the Queen's (Royal West Surrey Regiment), to be a Flying Officer. Dated October 4th, 1912.

Royal Flying Corps. Military Wing.—The appointment of Second Lieut. (on probation) Geoffrey de Havilland is antedated to September 2nd, 1912.

The following were announced in the *London Gazette* of the 26th inst.:—

Establishment. Royal Flying Corps. Military Wing.—Capt. George H. Raleigh, the Essex Regiment, Flight Commander, to be a Squadron Commander, and is granted the temporary rank of Major while so employed. Dated November 20th, 1912.

The undermentioned Flying Officers to be Flight Commanders, with the temporary rank of Captain while so employed. Dated November 20th, 1912: Lieut. Charles A. H. Longcroft, the Welsh Regiment, and Lieut. Alan G. Fox, Royal Engineers.

Lieut. Ernest V. Anderson, the Black Watch (Royal Highlanders), to be a Flying Officer, and to be seconded. Dated October 28th, 1912.

The Royal Aero Club has decided to contribute £50 towards the expenses of such experiments.

F.A.I. Conference.

The Royal Aero Club has decided to support the Aero Club de France in their request for an extraordinary conference of the Fédération Aéronautique Internationale, to be held in Paris in January next, to discuss the question of certificates in relation to Hydro-aeroplanes.

At this Conference it is also proposed to consider the advisability of establishing Continental Custom facilities (generally known as triptyques) for the entry of aircraft into foreign countries. Such an institution would be of great convenience, as it would obviate the necessity of carrying about large sums of money for Customs purposes.

Club Premises.

The Committee of the Royal Aero Club is taking active steps to secure new Club premises where the members will be able to enjoy the usual advantages of a social club. Before, however, anything definite is settled, the whole question will be submitted to a meeting of the Club Members.

Science Museum, South Kensington.

The Science Museum, South Kensington, is organising an Exhibition of early types of aircraft, and the Royal Aero Club has lent a Chanute Glider, which was presented to the Club some years ago by Mr. Fred Scully. This Exhibition will be open during December and January.

Presentation of Lantern Slides.

Capt. Harold Danvers has very kindly presented to the Club a set of lantern slides dealing with Foreign Dirigibles.

International Aero Show at Olympia.

The International Aero Show held by the Society of Motor Manufacturers and Traders, under the auspices of the Royal Aero Club, will open on February 14th, 1913, and terminate on February 22nd.

Full particulars can be obtained on application to the Exhibition Manager, Society of Motor Manufacturers and Traders, Maxwell House, Arundel Street, Strand, London, W.C., or the Secretary, Royal Aero Club, 166, Piccadilly, London, W.

In connection with this Exhibition, a section for models will be organised by the Royal Aero Club, assisted by the Kite and Model Aeroplane Association. The Royal Aero Club will offer prizes amounting to £50 in this section. Full particulars can be obtained from the Secretary of the Royal Aero Club.

Members of the Royal Aero Club will be admitted free on production of their membership cards.

166, Piccadilly.

HAROLD E. PERRIN, Secretary.

THE GORDON-BENNETT BALLOON RACE.

THE official result of the Gordon-Bennett balloon race has now been issued, and is given below, as well as the cash prizes won.

		kiloms.	£
1.	Bienaimé (France)	2,191	400
2.	Leblanc (France)	2,001	320
3.	Honnaywell (America)	1,800	250
4.	H. Lenert (Austria)	1,769	200
5.	De Beaulair (Switzerland)	1,523	150
6.	O. Korn (Germany)	1,385	115
7.	F. Gerard (Belgium)	1,291	70
8.	De Francia (Great Britain)	1,253	20
9.	De Muyter (Belgium)	1,182	15
10.	Usuelli (Italy)	1,111	10
11.	Eiermacher (Germany)	1,110	—
12.	Blanchet (France)	1,055	—

**To Artist-Draughtsmen.**

THERE is an opening for an artist-draughtsman on the staff of FLIGHT and AUTO. The Editor would be glad to hear, at 44, St. Martin's Lane, W.C., from any readers in this connection, with particulars of experience, and if possible specimens of work, including free-hand sketches, &c.

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

OWING to the unfavourable weather conditions on Saturday last week, the quick-starting competition had to be postponed. Sunday, however, turned out such a delightful day that as a result large numbers of people flocked to the flying ground to see the flying, which becomes more interesting every week.

The 70-h.p. Handley Page monoplane arrived from Hendon after a short stop at Sunbury in connection with the supply of petrol. It left Brooklands at 2.55 p.m. on the return journey to Hendon.

The Speed Hendicap (two laps) was keenly contested, and only 4 secs. covered the first three men, Mr. Sopwith accomplishing fastest time. The result was: 1st, Mr. J. Alcock (Hanriot-Farman biplane), 2 mins. 46 secs.; 2nd, Mr. Sopwith (Sopwith biplane), 2 mins. 48 $\frac{1}{2}$ secs.; 3rd, Mr. Knight (Vickers-Farman biplane), 2 mins. 50 secs. The winner, Mr. J. Alcock (of the Ducrocq school) has just qualified as a pilot, and this was his first race. Others who finished were Mr. Hawker (Sopwith biplane), Mr. Spencer (Spencer biplane), and Mr. Merriam (Bristol biplane). During the race, Mr. Barnwell, on a Vickers monoplane, gave a splendid demonstration of high flying, reaching a height of 4,300 ft. very quickly, after which he had to descend owing to the increasing darkness.

To-day, Saturday, a Quick-Starting Competition, which should have been held last Saturday, will take place, the following being a list of the entries:—Messrs. Hawker (Sopwith biplane), Merriam (Bristol), Spencer (Spencer), Bendall (Bristol), Sopwith (Sopwith), Pashley (Sommer), Barnwell (Vickers-Farman), Knight (Vickers-Farman).

On Sunday, a Bomb-Dropping and Alighting Competition will be decided, in which the following will compete: Messrs. Sopwith, Hawker, Merriam, Bendall, Spencer, Pashley, Percival, Knight, and Alcock.

Bristol School.—No flying possible on Monday morning last week, wind far too strong. In the afternoon, Bendall was first up, taking Mr. Ewing as passenger, and then going up as passenger himself to this same pupil, and giving tuition in a similar manner to Lieut. Mills. Bendall was also out with Mr. Loyd, taking the pupil for several tuition trips. Merriam taking Mr. Featherstone, and then another passenger. Lieut. Empson carried out four good solos in good style. Nothing further was possible, darkness setting in.

On Tuesday, Merriam was out quite early for a trial, taking with him Mr. Featherstone as passenger, afterwards going as passenger to Lieut. Mills and Mr. Ewing, the former pupil afterwards going out for four really good solos, landing well in each case. Bendall was occupied in giving tuition to Messrs. Featherstone and Loyd, Merriam being out behind Mr. Ewing and Mr. Loyd, this latter pupil being now quite ready for solos.

After making a trial on Wednesday, Merriam decided weather far too rough for school work, and work was confined to the hangars.

On Thursday, Merriam made a trial quite early, and then took out Mr. Featherstone for straights, pupil being in pilot's seat. No other work was done, wind being too strong.

Fog prevented start of the day's work on Friday until about 10 o'clock, when Merriam was out for a test, then Bendall out with Capt. Rickard. Merriam was passenger with Lieut. Mills, Mr. Ewing, and Mr. Featherstone, and also with Capt. Rickard. Bendall was up with Lieut. Todd and Mr. Ewing; afterwards Lieut. Mills made two very good circuits, landing very nicely. Merriam out behind Capt. Rickard, Lieut. Todd, Mr. Ewing and Featherstone; Lieut. Mills finishing up morning's work by making two very fine circuits. Wind rather bad in the afternoon. Merriam was out with Lieut. Todd and as a passenger to Mr. Featherstone, Bendall taking up Mr. Ewing, but nothing further was possible.

Saturday, Merriam went out for trial, afterwards up behind Lieut. Todd on straights, and then with Mr. Featherstone, Bendall was with Mr. Ewing for several straights, but strong wind prevented any solos by pupils. Merriam was out for another trial in the evening, but wind was considered too bad for school work.

On Sunday, in the afternoon, Merriam made a test and then went out with Lieut. Todd as passenger, Bendall going out behind Mr. Ewing, Merriam making another trip with Mr. Featherstone, but darkness prevented further flying.

Ducrocq School.—On Sunday, November 14th, Jack Alcock was making circuits and figure eights on the Farman, and the new pupil McAndrew good straights. Similar work was done on Monday morning, when Maurice Ducrocq was also in the air. In the evening, Alcock passed the first test for his *brevet*, but was unable to finish owing to darkness. He completed the test on the following morning in great style, landing on the mark. Maurice Ducrocq was doing circuits and McAndrew straights. On Thursday morning, Alcock, after a few circuits, made a short country trip, after which McAndrew put in some circuits for the first time and continued flying for 20 mins. very nicely. Alcock flew some more circuits with a passenger, and made another cross-country flight. Similar work was got through on Friday. On Saturday, Alcock made a good high flight over Weybridge and the surrounding country, landing with a *vol plané* from a 1,000 ft. On Sunday morning, Alcock and McAndrew were again at circuits, and in the afternoon Alcock won the first prize in the speed competition.

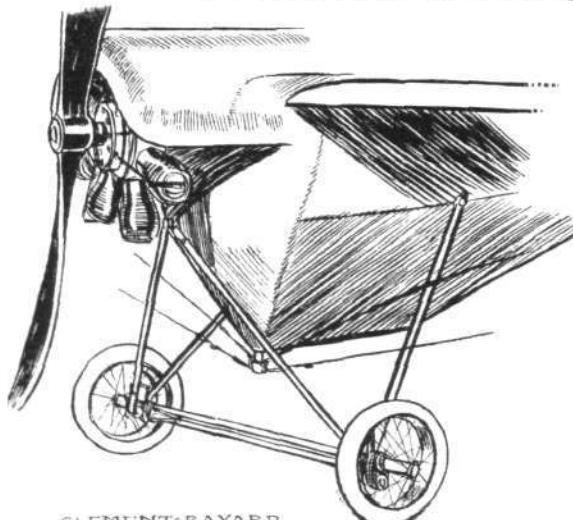
Vickers School.—Mr. Corballis, Tuesday last week, put in some very good figures of "eights" before breakfast, followed by Mr. Pollok, who did some very good straights at a uniform height. About the same time Mr. Soames made a really good flight on No. 5, finding it a little "bumpy" as he got up. Mr. Babington was also making straights and curves on No. 3, handling the machine perfectly in spite of it being only his second attempt. Wind put a stop to flying during the rest of the day.

Owing to high wind Wednesday was a blank day, but on Thursday Mr. Corballis was perfecting his eights on Farman, and Mr. Pollok doing a few more straights and curves preparatory to doing circuits. Major Cameron doing good straights on Farman, with Knight as passenger. Mr. Soames made another very good flight on No. 5, and Capt. Stott on the same machine later started on the second half of his *brevet* flight, but, owing to a misunderstanding, flew wide of the observers. This was in the morning.

Friday morning Mr. Barnwell made a trial circuit on the Farman, but found it rather windy for biplane pupils. After a test flight by



Two examples of the type of landing carriage that is being adopted by many aeroplane constructors in France. On the left is shown the running gear of the d'Artois torpille biplane, on the right that of the Clement-Bayard monoplane.



"Flight" Copyright.

Knight on No. 5, Mr. Soames went for his *brevet* and took it in faultless style at an average height of 500 ft., landing each time close up to the observers. This was really a fine performance in a distinctly nasty wind, which kept the biplanes in the sheds. Later on the wind moderated and Mr. Pollok made his first circuit on the Farman, putting up a very good show, and later he and Mr. Corballis, flying the machine alternately, put in numerous circuits, Mr. Corballis also making some very good eights. After a test flight by Knight, Mr. Babington made several straights on No. 5, and only the growing darkness prevented him from doing circuits the same evening.

Messrs. Pollok and Corballis Saturday morning putting in a lot of good work on the Farman, while Mr. Babington, who has progressed in a really remarkable manner, went up on No. 5 for the second time, and proceeded to do figures of eights in a bumpy wind. But for the wind getting up worse he would have taken his *brevet* the same evening, and thereby about established a record for monoplane "pupilage." Later in the morning Mr. Barnwell did a few straights on the Farman in a 15-mile wind to test the results of certain adjustments.

With the exception of about half an hour before breakfast, the whole of Sunday morning was too windy for flying. In the afternoon, Mr. Barnwell made a few flights with a passenger on the Farman, getting bumped about very much. Messrs. Pollok and Corballis alternately flew the Farman, finding the bumps quite enough for their amusement. Knight also flew the same machine in a pylon handicap, coming in third. Mr. Barnwell meanwhile went off on No. 5 with a view to testing its climbing powers and speed, but darkness brought him down after reaching rather over 4,000 ft.

Eastbourne Aerodrome.

VERY little work has been done during the past week owing to most of the pupils being absent. Messrs. Roberts and Thompson put in a fair amount of practice on Thursday afternoon. On Friday morning Mr. Hammond paid visits to both the local golf links, and took up several passengers. In the afternoon Mr. Thompson made his first solo, and gave everyone cold feet by doing two most alarming right-hand turns with his tail very low. He got down safely, however, and would have made an excellent landing, but just as the machine was about to touch the ground, he switched on again, and heeled over so much that the right-hand bottom plane struck the ground. Both the main spars were carried away and several stanchions broken. The Sommer biplane is now finished and looks very smart.

Farnborough.

Royal Aircraft Factory.—Mr. de Havilland out on BE 2 on Wednesday. Mr. Petre on Martin-Hansayde.

On Friday, Messrs. Bell and Petre up for their duration test, the former on the Anzani-Dep. Col. Cody out with Lieut. Harrison, R.F.C., as passenger.

Royal Flying Corps.—No. 1 Squadron.—H.M.A. "Beta" out Thursday and Friday last week, making two trips of one hour's duration, A. M. Protheroe piloting. "Gamma" out Friday for her trial trip. Since being repaired by the R.A.F., her behaviour being quite satisfactory with the exception of her rudder which buckled, forcing her to land down-wind.

No. 2 Squadron.—"A." Breguet Flight 213. Lieuts. Wanklyn, Playfair, and Shepherd making short flights on Thursday; on Friday, Lieut. Wanklyn up for 20 mins., Lieut. Playfair 30 mins., Lieut. Shepherd 25 mins., besides several shorter flights. Saturday,

Lieut. Shepherd up for hour's duration test at 2,000 ft., making several good *vols plané* to within 500 ft. of the ground, then re-ascending, Lieuts. Playfair and Wanklyn doing circuits.

"B." BE Flight 206. Machine not flown until Friday, owing to engine trouble. On Friday, Capt. Webb-Bowen two flights of 15 and 5 mins.

Capt. Longcroft on 201, which has just been given over to the R.F.C. since being overhauled by the R.A.F., up to 6,000 ft., his altimeter not registering any higher.

No flying on Wednesday, owing to mobilization scheme being carried out. Monday and Tuesday, a gale.

"C." Farman Flight 215. Capt. Becke out for 20 mins. with Capt. Pigot on an observation flight round Ash district, afterwards taking S.-Sergt. Thomas up for 10 mins., Capt. Brabazon and Lieut. Herbert doing circuits. Friday, Capt. Becke up for 25 mins. at 2,500 ft., with Capt. Brabazon as observer, later taking Lieut. Harvey-Relly and A.-Ms. Wilson and Smith for trips, Lieut. Herbert taking Lieut. Harvey-Relly and A.-Ms. Nash and Wilson for flights.

Liverpool Aviation School, Waterloo.

SATURDAY last, upon Mr. Melly's invitation, about 200 members of the Liverpool Engineering Society visited the hangars and had explained to them the details of the engines and the working of the three monoplanes. Although the weather was anything but suitable, Mr. Melly gave a short flight, including a figure of 8, for their benefit, which elicited considerable applause from the large crowd of visitors.

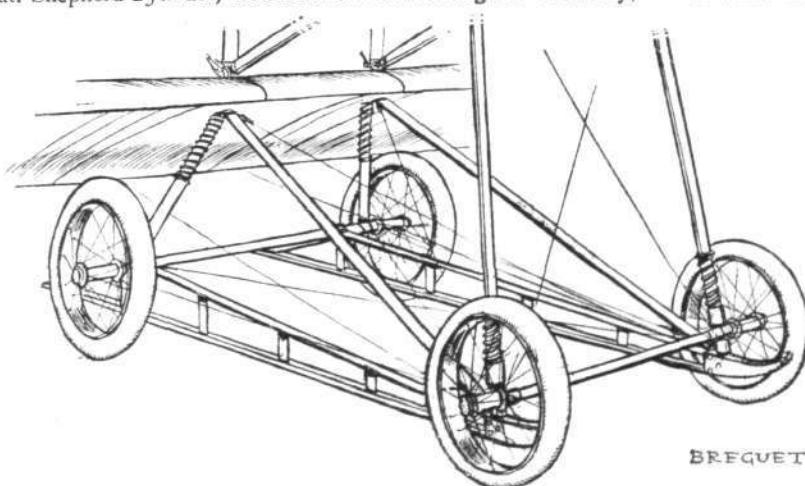
London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—School started in calm weather Monday, last week, at 12.40 p.m., under the superintendence of Mr. Manton, Major Madocks commencing with straights with instructor on No. 7 Grahame-White biplane, followed immediately by Mr. Power on same machine, having 10 mins. rolling with instructor. At 2.30, Lieut. Birch out doing straight flights on No. 7 under Chief Pilot Noel. Major Madocks doing solo straights on same machine. At 3.15, Mr. Lan Davis rolling on B 4, putting in good practice, and showing decided improvement. Next day, Lieut. R. G. D. Small, accompanied by Instructor Manton, doing straights on No. 7, at 10.20, followed by Lieut. Birch also doing straights on same machine. The wind then getting up, school was abandoned till 2.15, when Mr. Power was on No. 7, rolling with Chief Pilot Noel, afterwards solo rolling.

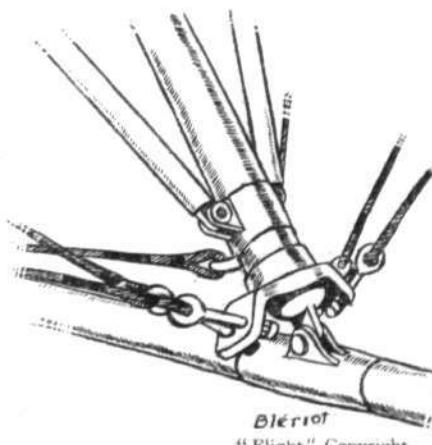
Calm morning Thursday, Lieut. Birch getting in good practice on No. 7 under Instructor Manton, doing excellent circuits. Major Madocks out at 9.40 doing straights with Mr. Noel, followed by solo straights. Lieut. R. G. D. Small doing straights on No. 7 with Mr. Manton. At 11.30 Major Madocks again on No. 7 doing straights.

Friday, Lieut. Birch on No. 5 Grahame-White biplane, doing straights and also circuits, flying very steadily at an altitude of 300 ft., doing figures of eight and landing well.

During the week some good exhibition flights have been put in. On Monday, Instructor Manton out on No. 7 Grahame-White biplane at 12.30 p.m. Chief Pilot Louis Noel out in the afternoon on the 80-h.p. Farman, carrying passengers. On Thursday, Mr. Noel on 80 h.p. Farman, with Mrs. Stocks as passenger, followed by Mr. Manton on No. 5 Grahame-White biplane, giving a good exhibition lasting 45 mins. Mr. M. Desoutter on No. 6 Blériot monoplane. Mr. Richard T. Gates gave an exhibition flight of 10 mins. on No. 5, this being his first flight following his recent



BREGUET



Blériot

The new form of landing gear that the French Breguet firm are adopting.

"Flight" Copyright.
The New Blériot Chassis.—The fitting to which the front wing spars are stayed.

accident. Mrs. Stocks on No. 6 Blériot monoplane. Mr. Grahame-White also made a good flight. All these flights taking place in spite of mist and rain.

Mr. Manton out on Friday on No. 5, followed by Mr. Noel on 80-h.p. Farman with passenger.

Blackburn School.—Dr. Christie was out Sunday last week, on the rolling machine, half an hour practising straight flights.

School work commenced Monday at 8 a.m. in charge of Mr. H. Blackburn, who first tested the air in a 5-mins. flight; afterwards Dr. Christie had 30 mins. practice, followed by Messrs. Lawrence Spink, and Buss with 15 mins. each, all made very good use of their opportunities.

Tuesday, school came out with brevet machine, Mr. Blackburn doing a short test flight, and Mr. Buss doing 15 mins. practice in straight flights. Weather too rough Wednesday; but Thursday, in the morning, Mr. Buss got in about 1 hour's practice, chiefly in landings. In the afternoon, Messrs. Buss and Spink had 25 mins. and 15 mins., respectively.

Friday forenoon Messrs. Buss and Spink out with brevet machine practising landings. The latter made one rather heavy one and finished up with the machine flat on its back. Spink was of course wearing a safety belt and was scarcely shaken, and the machine being very strongly built suffered damage only to the extent of a broken propeller, two chassis struts and the front portions of skids damaged.

Saturday morning, at 8 a.m., Dr. Christie in a moderate wind practising straight flights for half an hour, and on Sunday school out at 8 a.m. Mr. Blackburn considers it does no harm to demonstrate the efficiency of the school equipment and so took the rolling machine for a 15 minutes' flight over the Welsh Harp and Hendon, at 700 feet, finishing with a spiral *vol plané* into the aerodrome. The machine was handed to Dr. Christie, who practised straight flights, getting a good height in each straight, followed by Mr. Buss, both of them ignoring the breeze which was blowing.

Blériot School.—On Tuesday, last week, Lieut. A. Loftus Bryan, who has just joined the school, was receiving preliminary instruction in the sheds, and later on took out LB 1 for rolling practice, and, together with R. Desoutter, who had his first lesson on the same day, made a very good start, both using the rudder very well and keeping fairly straight.

Wednesday was a blank so far as school work was concerned, but on Thursday morning Lieut. Loftus Bryan and R. Desoutter were doing very well on No. 1 at rolling practice, and again during the afternoon, until the weather became so bad as to put a stop to further work for the day.

A full day's work was put in on Friday by Lieut. Loftus Bryan and R. Desoutter at rolling practice, in the course of which Desoutter managed to do a short hop owing to hitting a lump on the ground and was so surprised to find himself off the ground that he hastily descended again. Towards the evening he was doing very well indeed with the tail well up, and should make a good flyer. Lieut. Loftus Bryan also got his tail off on several occasions and with a little more practice should be going quite straight.

Saturday morning was a trifle gusty but Lieut. Loftus Bryan managed to do a little rolling practice before the wind became too strong.

Deperdussin School.—Mr. Scott a new pupil, started out Tuesday last week on taxi No. 2 and handled the machine very well, the wind, however, was very choppy and it was decided to postpone further practice till later. Wednesday was a blank day for school work, the wind being much too strong.

Lieut. Mapplebeck, Lieut. Hooper and Mr. Whitehouse each put in some splendid practice Thursday on brevet No. 3, being out for nearly three hours, making fine progress. Mr. Scott had some further runs on taxi No. 2 doing very well. Mr. Durand also put in an appearance after a two or three weeks' absence, and got in several turns on the same machine. Mr. Valazzi, the famous juggler and pedipulator now appearing at London halls has joined the school in order to add to his many accomplishments the art of flying. He put in several turns on taxi No. 2, and gives promise of being a very apt pupil.

The weather improved greatly Friday after the morning's fog and allowed fair time for practice. Instructor Brock after doing circuits to test brevet No. 3, and finding it satisfactory handed machine over to Lieut. Mapplebeck, Lieut. Hooper and Mr. Whitehouse, who put in some good flights and made excellent landings. Mr. Valazzi and Mr. Scott and Mr. Durand were also busy "taxiing" on No. 2 machines and got in some fine practice. Mr. Scott later took out No. 3 brevet for a trial flight and handled the machine very well. A really enjoyable and useful afternoon's practice for everyone.

Saturday, Lieut. Mapplebeck and Lieut. Hooper and Messrs. Whitehouse and Scott were out putting in good straight flights on No. 3 brevet. The two first named have made fine progress during

this week and are now ready for brevet No. 4 machine on which, given fair weather, they should soon secure their tickets. Mr. Valazzi also put in some very good practice on taxi No. 2 and getting along very well.

W. H. Ewen School.—During the last week the weather has been favourable for pupils' flying practice and a most satisfactory week's work was put in. On Monday the school machines were out at 11 a.m. Under the instruction of M. Baumann Mr. L. Russell was making good straight flights at 30 ft and Lieut. M. W. Noel was hopping on monoplane No. 2. After lunch Messrs. Russell and Gist were doing straight flights and half circuits and Lieut. Noel straight flights on monoplane No. 2. Messrs. McGregor and Prosser were rolling on monoplane No. 1. Mr. Sydney Pickles was also getting good results from pupils on the 35 Caudron biplane. Lieut. McMullen and Mr. Lawford were making nice straight flights, half circuits and good landings. M. Baumann then put up a good exhibition flight on the same machine. Flying for about 15 minutes he reached an altitude of several hundred feet, finishing with a fine *vol plané*. Mr. Pickles was also on the 60-h.p. Caudron biplane making several solo and passenger flights. On Tuesday the pupils were out at 9.45 a.m. and Messrs. Prosser, Zubiaga and Cowling all got in an excellent forenoon's work on monoplane No. 1. In the afternoon Messrs. Zubiaga, McGregor and Prosser were again out for instruction from M. Baumann and were doing well on No. 1 monoplane.

Wednesday was too windy for out-door practice but Thursday was favourable and a big day's work was got in. At 7.30 a.m. M. Baumann had out monoplanes Nos. 1 and 2. Lieut. Noel and Mr. Russell were flying good straight flights at 30 ft. on the latter and Messrs. Cowling, McGregor, Prosser and Zubiaga were rolling and hopping on No. 1. Mr. Pickles was also busy with the 35 Caudron and after a test flight handed the machine over to Mr. Warren who made several good straight flights. Mr. L. Russell received his first instruction on the same machine and showed good progress. After an exhibition flight by M. Baumann, Mr. Sydney Pickles went for a cross-country flight. When over the Welsh Harp he switched off at 3,000 ft. and easily reached the aerodrome in one long glide. During the afternoon he was again out with the 35 Caudron and after a test flight he handed the machine over to Messrs. Lawford and Russell who each made twelve straight flights handling the machine well. Mr. Warren also put in some good flying on the same machine. M. Baumann was busy with the school monoplanes and under his supervision Lieut. Noel and Mr. H. Gist were flying well on monoplane No. 2, while Messrs. Zubiaga, McGregor, Prosser and Cowling were all doing well on monoplane No. 1. To finish an excellent day's work Mr. Pickles made several solo and passenger flights on the 60-h.p. Caudron biplane.

On Friday school work started at 10.45 a.m. M. Baumann was out with the school monoplanes. Lieut. Noel was flying good straight flights at 20 ft. on No. 2, and Messrs. Zubiaga, Prosser and McGregor were hopping on No. 1. Mr. Cowling was rolling on the same machine. After lunch a full afternoon's work was put in. Lieut. Noel and Mr. Gist were flying well at 30 ft. and making good landings on No. 2 monoplane. Messrs. Cowling, Zubiaga, McGregor and Prosser were all making good progress on monoplane No. 1. Mr. Pickles after a test flight on the 35 Caudron biplane handed the machine over to Messrs. Lawford, Russell and Warren, who were all making excellent straight flights at 30 ft.

Salisbury Plain.

Bristol School.—Pizey was first out on Monday morning last week, taking Lieut. Negrescu in the side-by-side, and then Lieuts. Chiscaneanu and Parvelescu, each pilot taking charge of the controls. Pizey was again up with Lieut. Chiscaneanu, this time in the tandem monoplane. England took Lieut. Negrescu in the side-by-side monoplane. Sippe being out giving tuition to Lieuts. Parvelescu and Chiscaneanu in the tandem monoplane, this completing the morning's work. School work was resumed in the afternoon, Pizey being first up, and, with Lieut. Parvelescu as passenger, flew over to Upavon with a parcel for the Military Authorities. Prince Cantacuzene was up for a good solo, the *remous* about this time being very bad. England was away giving tuition to Lieuts. Parvelescu and Negrescu in side-by-side monoplane, and then with Lieuts. Parvelescu and Chiscaneanu in one of the tandem machines. Sippe was also giving tuition to Lieuts. Negrescu, Parvelescu, and Chiscaneanu, this bringing the day's work to a conclusion.

England was first up on Tuesday morning, ascending on the side-by-side monoplane with Lieuts. Negrescu, Parvelescu and Chiscaneanu. Pizey went for a trial of the biplane, afterwards ascending on the side by-side with Lieut. Chiscaneanu for two trips and once with Major Nacree and Lieuts. Parvelescu and Negrescu. Lieut. Negrescu was up for his first solo on side-by-side monoplane, flying well and landing neatly. Prince Cantacuzene satisfactorily

passed the tests for his certificate in fine style, observed by Capt. Dickson and Capt. Conner.

Flying was impossible in the evening, the weather being far too boisterous.

On Wednesday the wind was blowing quite a small gale all day, and no attempts were made at flying.

England was out quite early on Thursday, giving three tuition trips to Mr. Tower, a new Bristol recruit. Weather too bad for further flying. England went for test in one of the tandem monoplanes, but found wind very strong, then went up with Lieut. Rees. Prince Cantacuzene made a very fine flight on the tandem machine. England taking Lieut. Rees for a trip on another machine, and they made a trial on a biplane, this completing the evening's work.

On Friday England tested conditions on monoplane, then took Mr. Tower on a biplane later with Lieut. Parvelescu on side-by-side machine. Capt. Penfold was out for a good solo on biplane, whilst Lieut. Negrescu took a side-by-side monoplane and had a fine trip, landing quite well. Capt. Penfold was again out for a biplane solo, this finishing the morning's work. Wind was much too strong in the evening and school work was not attempted.

On Saturday, Pizey ascended first on one of the tandem machines, and flew over to Upavon with a box of stores for the Central Flying School. Busteed was out in one of the 80 h.p. monoplanes, with Prince Cantacuzene as passenger. Pizey made a test of a new engine, but wind too strong for further flying.

Busteed was out for a flight Sunday morning, but no other trips were made the wind being quite strong. Prince Cantacuzene went for a really fine solo in the afternoon on one of the tandem machines, his landing being quite good in the strong and puffy wind, which was much too bad for school work.

Royal Flying Corps.—In consequence of the unsettled weather there is little outdoor work to record, although a good deal of work has been carried on in the hangars, overhauling the various machines. The first flying was on Thursday when Major Higgins was out on biplane 203, and after doing several circuits handed the machine over to Capt. Fox who made one or two trips on it. These same officers, with Lieut. Ashton, also had this biplane out on the following day and did some scouting. On Friday morning Major Higgins was on biplane 203 with Lieut. Porter and flew over to Farnborough. They arrived back again during the afternoon during a shower of rain and landed safely after a sharp dive. Capt. Fox took charge and made several circuits of the Plain. Lieut. Smith-Barry flew over from Upavon on biplane 204 and landed by a fine spiral *vol plane* from a height of 1,200 ft. He returned after only a short stay. On Saturday morning Lieut. Porter left for Farnborough by motor and flew back on Maurice Farman biplane 216. He reported having a somewhat rough journey amongst the clouds.

Upavon (Central Flying School).

Monday morning last week opened fine, with later slight rain for half an hour or so. Capt. Fulton ventured out during a shower on Avro 406. Sidbury Hill, which is usually visible in anything like clear weather, was lost to view in the low lying mist wreaths all the morning. The mist lay very thick along the Avon valley, and the machines were lost to view frequently. However, afternoon conditions were ideal for flying. Petty Officer Andrews was on Avro 404, practising figures of eight for his certificate. Capt. Fulton, his instructor, and Lieut. Hubbard were observers on behalf of the R.Ae.C. Andrews, after 30 minutes' flying in good style, won his *brevet* with great credit both to himself and Capt. Fulton, under whose able tuition he had been for a short while only. Capt. Fulton also took another naval man out for instruction, Leading Seaman Bateman, and was out with him about 40 mins. Avro biplane 406 was fairly hard worked during the day, being taken out no fewer than thirteen times altogether. Capt. Fulton was out twice for short spins round the aerodrome. Lieut. Hubbard took the machine out for three flights of 15 mins. each. Lieut. Martyn was also on the same machine for three flights, also Lieut. Young. Capt. Salmond took it twice for spins of about ten minutes' duration. The British-built Maurice Farman was out four times during the day. Lieut. Cholmondeley took up a passenger for ten minutes and made a very good flight, and Lieut. Longmore, R.N., was also out for a turn round the aerodrome. Two fine long flights of 50 mins. and 60 mins. respectively were put up on the same machine by Lieut. Freeman, R.N., and Lieut. Courtney, the latter officer flying for a full hour. Fine flights were done on the Maurice Farman 403. Lieut. Abercromby, Major Ashmore and Major Trenchard taking the machine out for about 15 mins. each, and Lieut. Freeman was out for a spin lasting about 10 mins. A fine flight of 20 mins. on the same machine was performed by Lieut. Winfield Smith. Lieut. Shepherd went out on the Short tractor 413 no fewer than seven times on Monday, six times alone and once for a spin with Air Mechanic Copper, lasting about 5 mins. Capt. Risk also went twice on the same machine—once for a very short turn round the aerodrome, and the second time keeping up

about 20 mins. or more. The small biplane Henry Farman, 412—which was originally at Farnborough, and was sent over to the Central Flying School in sections, where it was reconstructed—seems to handle well, and is a fairly fast machine. Major Gerrard went out in it alone for a few minutes, afterwards returning and taking up Chief Mechanic Scott, R.N., for a flight lasting about 6 mins. The same officer afterwards went out twice again, each time taking Lieut. Shepherd, R.N., as passenger. Lieut. Lushington and Lieut. Longmore, R.N., also made a couple of good flights each on the same machine, and Lieut. Smith-Barry was also on it for about 12 mins. round the aerodrome. The Short biplane, 401, was out a good few times. This type of machine appears to be rather on the substantial side, and is without a doubt strongly constructed, which accounts for its somewhat heavy appearance. It has a good turn of speed notwithstanding, but its climbing powers have not been fully tested. Capt. Risk took up Leading Seaman Brady for a couple of instructional flights, afterwards going out for about 10 mins. with Gunner Allen R.M.A., as passenger. Lieut. Pepper, Lieut. Allen, Lieut. Atkinson and Lieut. Lushington each took the machine for flights round the aerodrome, averaging about 12 mins. a trip. Lieut. Hartree, with Capt. O'Neill as passenger, was out about 20 mins., and made a very good flight. Major Gerrard then took Leading Seaman Prichett four times for instruction and Lieut. Shepherd, R.N., went for a short spin on this same machine. Pizey, the well-known aviator, came over to the Central Flying School on a Bristol monoplane, with an officer of the Indian Army as passenger. The Bristol monoplane is of rather striking appearance and very fast. It appeared as a mere speck on the horizon one minute and a minute or so afterwards Pizey made a good landing in front of the hangars. This machine also rises from the ground very rapidly and easily.

Tuesday morning was very dull with a fresh northerly wind blowing across the aerodrome, which made it exceedingly bumpy for those who ventured out. Major Gerrard was out on Short 401 taking up Leading Seaman Brady for a quarter of an hour. Lieut. Lushington made three trips on the same machine each averaging about 12 mins. One could notice how alert the different pilots were while manœuvring in the fresh wind. Capt. Risk took Leading Seaman Brady for three trips on 401. The little Henry Farman was also out; Major Gerrard and Lieut. Shepherd, R.N., each going up for about 6 mins' flying. Avro 406 was not out at all, but the Avro biplane 404 was out half a dozen times, Capt. Salmond, Lieut. Young, and Lieut. Martyn each going up for about



M. Richet, the pilot who was flying the new Breguet at Hendon Aerodrome.

10 mins. each. Lieut. Hubbard made two flights on this machine, and Air Mechanic Higginbottom also did a circuit. Lieut. Smith-Barry did a fine spiral decent on the Maurice Farman 403 from a height of 2,500 ft., and Major Ashmore, Lieut. Courtney, Lieut. Freeman, and Lieut. Winfield Smith each did some good flying on the same machine. Lieut. Stopford did a 8 minutes' trip on Maurice Farman 415.

Wednesday was not very promising as the wind was rather strong from the north-west, and there was some rain. Major Gerrard ventured out, however, and took up Leading Seaman Brady for seven minutes on Short biplane 401. Lieut. Lushington also went out on this machine, and was away about 15 minutes. Lieut. Cholmondeley went up with Lieut. Pepper for 12 minutes on the Maurice Farman 403, and Lieut. Abercromby, Lieut. Freeman, and Major Ashmore made some good flights on the same machine, being out about a quarter of an hour each.

Thursday was a dull day with the wind still in the north-west, and the flying was practically a repetition of Monday's doings.



NOTES ON THE WORK OF GORDON ENGLAND, DESIGNER OF THE LATEST BRISTOL BIPLANE.

GORDON ENGLAND has terminated his connection with the Bristol Co., but will not actually leave Filton until he has completed the tests of the two new tractor biplanes that are his latest design. When these are finished, however, he intends to widen his experience of the world of flight, which is his sole reason for leaving the Company, with which he parts on the best of terms. Gordon England, as our readers will remember, has had a varied experience already, and he commenced his acquaintance with the air long before most modern pilots knew what it was like to be aloft. He had the temerity to practise gliding in the little man-carriers made by that early pioneer, Jose Wiess, who was and still is a strong advocate of the inherent stability of the bird-like wing, with crescent shaped entry, retreated up-turned tip, and a variable camber from shoulder to tip.

Jose Wiess made hundreds of models down in the country far removed from observation, and at last he succeeded in bringing his knowledge of the subject to a point at which he could be sure of building a model and so loading it that it could glide quite air-worthy in any wind. Sometimes, when the wind was strong, he would launch his models, which weighed several pounds, and they would soar upwards and backwards in the air-currents blowing up the side of the hill that served as his aerodrome. When he had reached this point, he obtained the most complete confidence in his system, and so, too, apparently, did Gordon England, for when Wiess made a machine large enough to carry a man Gordon England never hesitated about being the pilot. He just sat in the little cockpit, which would hardly hold him, and was pushed off down the steep slope. Nothing happened for a little while, and there was a precipitous drop in view straight ahead if nothing continued to happen indefinitely. Before the unpleasant alternative could occur, however, the little machine had gathered enough speed for flight, and proceeded to glide off through the air. Very soon it was some 20 or 30 feet above the ground and Gordon England had

Friday opened rather misty, but the sun came out later, and there was a light north-west wind. Capt. Fulton took Leading Seaman Bateman out for 20 minutes' instruction, and then allowed him to do straights for 15 minutes alone. Leading Seaman Bateman afterwards did a good circuit in eight minutes. There was also good flying on the other machines, similar to that performed by the various officers early in the week.

Saturday was very dull and bitterly cold, with a strong north-west wind. Lieut. Cholmondeley with Paymaster Lidderdale, R.N., left on Maurice Farman 415 for Winchester, but after battling with the stormy wind and encountering sharp rainstorms, returned, being out about an hour. Air Mechanic Higginbottom climbed up to a height of 2,500 ft. on Avro 404, doing a very good performance. The Maurice Farman 215 came over from Farnborough, piloted by Capt. Beck, who was accompanied by Lieut. Martyn as passenger. Pizey also paid another visit to the school on Bristol monoplane from Lark Hill.

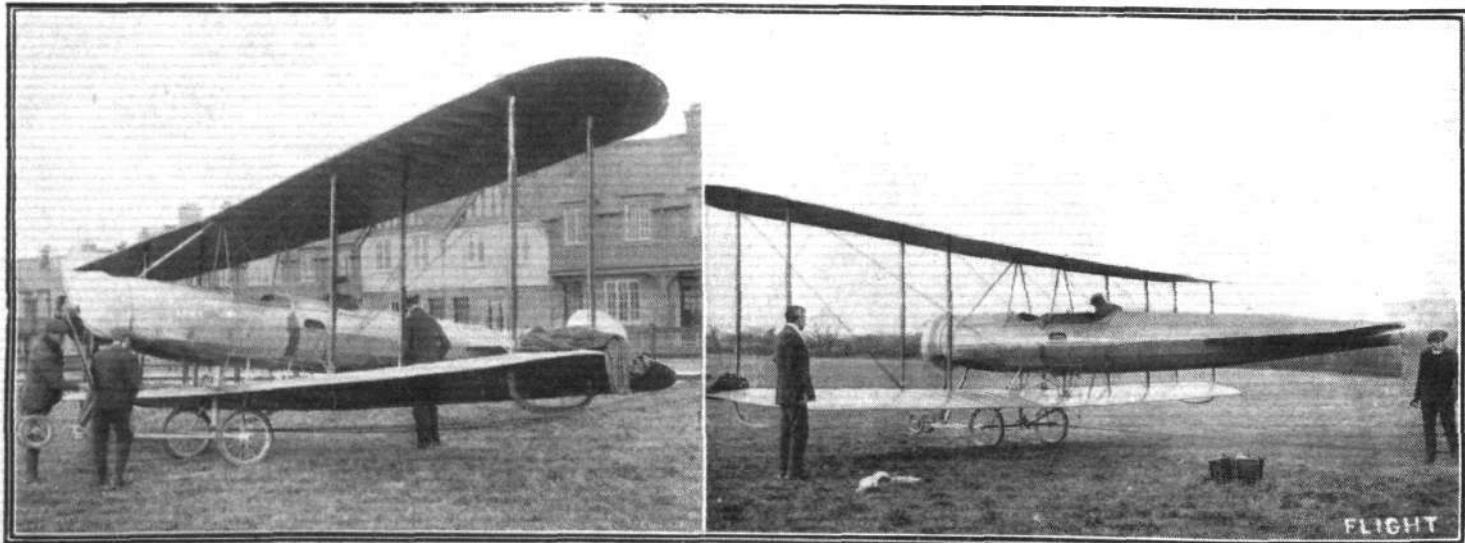
Sunday and Monday no flying.



no controls of any sort to guide or control it. He could regulate the position of the centre of gravity a little by leaning forwards or backwards, but if the machine couldn't fly he could do little or nothing to make it, and if it were not inherently stable it was a sure thing that he would be tossed out sooner or later. Although he made many such glides, however, and on some occasions actually soared in strong winds he never met with any mishap. These facts are even more interesting now than they were considered to be at the time. Indeed, at the time, comparatively few people either knew about the work that was done, or appreciated its significance.

M. Eiffel has also been making some experiments recently on surfaces of double curvature, and he has even expressed surprise at the results, for he found a tendency for the lift to drift ratio to improve with speed, and for the movements of the centre of pressure with changes of angle to be restricted to a much smaller zone than is common with wings of single curvature. The double curvature wing has long since been the subject of experimental research by Mr. W. Turnbull, in Canada, and he also drew attention to certain merits of the shape. The connection between this work and that of Wiess, and other experimenters like Etrich and Handley Page, lies in the tendency to give the so-called bird-like wings a reversal of curvature in the run. Sometimes this takes place all along the trailing edge and sometimes it is confined more particularly to the extremity, but there is no doubt that one way and another considerable interest attaches to the feature.

Gordon England's work as a designer has, of course, necessarily been confined within the limits of the conventional, so far as general lines are concerned, and although he might doubtless like to have the opportunity of getting unfettered expression to his ideas, nevertheless the success that he had achieved with what may be described as the commercial type of machine is only all the more to his credit on that account. We publish two illustrations of his latest biplane,



FLIGHT

Two views of the latest Bristol biplane designed by Gordon England. Two similar machines of this class, built by the British and Colonial Aeroplane Co. are now under test.

two of which have been built by the British and Colonial Aeroplane Co., and are at present undergoing tests.

The wings span 12 metres, and have a chord of 1.55 metres, so that the aspect ratio is nearly 8. The gap is 2 metres, which is 1.3 times the chord, and considerably greater than usual. Recent experiments apparently tend to show that the practice of making the gap equal to the chord is equivalent to curtailing the effective area by as much as 17 per cent. On the other hand, there are difficulties about a high gap, which not only adds weight and resistance in extra strut lengths, but also to localise a centre of resistance at a considerable leverage from the pitching "pivot" that might under certain circumstances tend to disturb the longitudinal equilibrium of the machine. In these machines, however, the longitudinal equilibrium appears to be as stable as in the preceding biplanes which Gordon England designed for the Bristol Co. Although those particular machines were under-powered for the Trials conditions, and were withdrawn from official test on that account, they were frequently flown during that period, and on one occasion Gordon England flew for nearly an hour and a half with the elevator wires actually tied up so that they could not move. It is extraordinary, but nevertheless a fact, that he was unaware of the fault, which was due to an oversight on the part of a mechanic who had been making an adjustment to some other part of the machine. The circumstance of the flight might lack significance from the mere length of its duration but for the fact that it took place at the very time when Fenwick was killed, and the gust that capsized the Mersey monoplane also rocked the Bristol biplane into an excessively steep bank. During the whole of the flight, England was very busy with his warp, but he never had any occasion to use his elevator, otherwise, of course, he would have noticed that it was out of action. Even when descending, he merely switched off one half of the 100-h.p. Gnome and allowed the machine to plane down in its natural attitude. When nearing the ground, however, he wanted to use his elevator and found that it was absolutely jammed, but he alighted safely by a judicious use of the switch.

The present machines have an overall length of 8 metres and a fixed tail plane spreading 30 sq. ft. in area. To this is attached an elevator flap spreading 15 sq. ft. and having 5.8 metres leverage over the centre of gravity of the machine. The main planes are set at 5° incidence to the line of propeller thrust, and the tail area is calculated to be sufficient to counteract the retrogression of the centre of pressure on the main planes when their incidence to the line of flight is 4.5°. This correction is independent of the action of the elevator, and Gordon England has found in actual practice that it is distinctly possible to feel the correcting tendency of the fixed tail when the elevator is first used on these machines for the purpose of initiating a steep descent. The elevator and the



WEEK-END FLYING AT HENDON.

YET another very busy week-end was spent at the Hendon Aerodrome on Saturday and Sunday last. Both days were rather windy, but this did not prevent an almost incessant series of exhibition flights from being got through. On Saturday, from 2.45 p.m. until 4.30, only once was there an interval longer than five minutes between the flights. The first up was M. D. Manton. on the 50-h.p. Gnome-Grahame-White 'bus, he flying round the aerodrome for about 12 mins. It was his first experience of a high flight in a nasty wind, and he showed himself capable of holding his own. A few minutes before he came down, Louis Noel got away on the 80-h.p. Gnome-Henry Farman biplane, taking with him a passenger. He remained up for about ten mins., after which Marcel Desoutter started off on the 50-h.p. Gnome-Blériot monoplane, to be followed 2 mins. after by Sydney Pickles on the 60-h.p. Anzani-Caudron biplane. The former remained up for eight minutes flying very high and the latter for five minutes. As Desoutter came down, Noel again went up on the "eighty" with a passenger. While he was in the air, Claude Grahame-White, just back from Spain, got into the 'bus, but had no sooner started than it was noticed that the left-hand ailerons remained hanging down, and as the biplane left the ground she started to veer round to the left, in spite of Grahame-White's endeavours to keep her straight, he apparently being unaware of what was wrong. It was when the biplane had turned round towards the enclosure, enabling him to see a little crowd running towards him and waving him down, that he landed without any damage. The aileron wire had got caught in the seat, and after this had been put right, Grahame-White gave us an exhibition of about five minutes' duration. When he finished he handed the machine over to Manton who made an eight minute flight, during which Sidney Pickles, on the 60-h.p. Caudron biplane, and Desoutter on the Blériot, ascended to a height in the neighbourhood of 2,000 ft. Both machines were lost to view in the clouds again and again. At one time, the Blériot, ghost-

wing warping are operated by a central lever control. The rudder, which is carried at the extremity of the tapered cylindrical fuselage, has 9.5 sq. ft. of surface.

The area of the wings is 387 sq. ft., the weight of the machine empty is 1,096 lbs., and it carries 900 lbs. useful load in normal flight. The 80-h.p. Gnome with which it is equipped develops 75 effective h.p. Thus, the weight per h.p., W_1 , is 26.6 lbs., and the weight per square foot or wing loading, is 5.15 lbs.

Applying this wing loading to the graph of the hypothetical aeroplane developed in FLIGHT from the Military Trials, the appropriate wing-speed is given by the expression $V = \sqrt{900 W_2}$, where W_2 is the loading and V is the speed in miles per hour. In this case, the wing-speed would be 68 m.p.h., and the assumption of the hypothesis is that the design of the machine is such that it experiences a resistance of 1 in 6 at that speed. A resistance of 1 in 6 with a load, W_1 , of 26.6 lb. per h.p. is represented by a thrust of 4.45 lb. per h.p., and this at 68 m.p.h. represents 80 per cent. efficiency, which is higher than any propeller so far tested in model form has given.

The propeller on this machine is 8 ft. in diameter, which represents 67 sq. ft. of disc area per h.p. The thrust over the disc area is thus 6.65 lb. per sq. ft. and, so far as can be judged from the results of the Military Trials, this is a high value for the best efficiency at a speed in the order of 68 m.p.h. In fine, we should be inclined to consider that the propeller is rather small. Allowing 73 per cent. efficiency, and assuming that small variations in power produce speed changes proportional to the square root of the power, then the speed corresponding to 73 per cent. efficiency will be 65 m.p.h. At the speed and efficiency the power will be equal to maintaining a thrust of 4.2 lbs. per h.p., but if 4.2 lbs. per h.p. is to suffice for the propulsion of 26.6 lbs. per h.p. it is clear that the inclusive resistance must not exceed an equivalent grade of 1 in 6.2. In fine, the machine has to justify itself as a low resistance biplane.

It will be interesting to learn in due course what maximum speed this machine does attain fully loaded, but it happens that the designer expects to realise 65 m.p.h.

The engine, an 80-h.p. Gnome, is overhung in front, and the under-carriage is very close to the lower plane which limits the propeller diameter.

The body stands some little way above the lower plane and beneath the body project two tubular vertical struts of unequal length, one of which stands immediately above the axle, while the other stops short just under the main plane and is joined to the former by a diagonal. The axle ends are attached to the body by crutch-like diagonal struts, as can be seen by a close examination of the photographs.

The rudder, of 9.5 sq. ft. area, is operated by two pedals, instead of a pivoted bar.



WEEK-END FLYING AT HENDON.

like, could only just be seen, when suddenly the Caudron *en vol plané*, made its appearance, seemingly immediately above the former, which again disappeared, so that it looked as if by some magic the monoplane had turned into a biplane. This theory was soon disproved, however, for both Sydney Pickles and Desoutter descended immediately after in their respective machines. In the meanwhile, Noel was again on the Farman for a 12 min. flight. After this, two trial flights were made on a new British-built Deperdussin monoplane, with an 80-h.p. Anzani engine, by Lieuts. Porte, R.N. and Gordon Bell respectively. Sydney Pickles then paid another visit to the clouds on the Caudron, this time remaining up for about 20 mins. Just after he had started, the 70-h.p. Handley Page monoplane made its appearance and put up a most creditable performance.

Sunday turned out gloriously fine, but with a high wind early in the morning. The Handley Page monoplane came out for all that, and made several flights round about Hendon, finally starting out, with a passenger, for a non-stop trip to Brooklands and back. A choked petrol pipe, however, brought the monoplane down in a ploughed field at Sunbury, a few miles away from Brooklands, on the return journey, so whilst help was awaited from the last named place, the pilot and passenger were hospitably entertained by the owner of Charlton Court, near which place they had descended. It was decided that the passenger should proceed to Brooklands by car, the monoplane getting out of the ploughed field in excellent style and finishing its trip *via* the air. They left Brooklands again just after three o'clock and arrived at Hendon 23 mins. later.

Two minutes to three o'clock, Manton started the first of the numerous exhibition and passenger flights which continued, almost without a break, until 4.50 p.m. About 30 flights were made altogether, the machines going up and coming down again as it were on each other's heels in such a way that it was almost impossible to keep count of the numerous flights made. Louis Noel, for instance, made no fewer than eight flights on the 80-h.p.

Farman, mostly with passengers, whilst the Handley Page monoplane made about six passenger flights, and Sydney Pickles, on the 60-h.p. Caudron, five (four with passengers). Desoutter was up twice on the 50-h.p. Gnome-Blériot, as usual flying very high, and later in the evening Mrs. Stocks took the same machine up for about six mins. in fine style. Lieut. Porte was also making

trial flights on the British Dep. and H. M. Brock flew the 35-h.p. Anzani-Dep. The last flights of the evening, were far and away the most picturesque we have seen at Hendon, for on one side there was the red glow of the sun-set and on the other side, the large, full moon across the face of which the machines would be seen to pass every now and again.

BRITISH NOTES

The Airship Over Sheerness.

FURTHER questions were put to the First Lord of the Admiralty in the House of Commons last week regarding the reported visit of a foreign dirigible to Sheerness, and Mr. Churchill said that he had caused inquiries to be made, and had ascertained that an unknown aircraft was heard over Sheerness about 7 p.m. on the evening of October 14th. Flares were lighted at Eastchurch, but the aircraft did not make a landing. There was nothing in the evidence to indicate the nationality of the aircraft.

In reply to another question, Mr. Churchill said that we had not any airships equivalent in size and power to the Zeppelins or any airship capable of travelling at 60 miles an hour. With regard to aeroplanes, he was happy to say that we had many Naval flyers who could fly over sea or across country at speeds approaching 70 miles and upwards.

A Message from Count Zeppelin.

COUNT ZEPPELIN, who was in charge of "L1" during her 30-hours' cruise, has made a statement that none of his airships approached the English coast on the night of October 14th.

Memorial to Army Aviators.

ON Wednesday last a granite obelisk which has been erected in memory of Capt. Patrick Hamilton and Lieut. Wyness Stuart, two of the Army aviators who lost their lives in the recent army manoeuvres, was unveiled at Willian, midway between Letchworth and Hitchin, on the road to Wymondley. The ceremony was attended by Major Brooke-Popham, representing the Royal Flying Corps, as well as representatives of the Royal Aero Club.

Mr. J. L. Hall at Sheffield.

DURING last week Mr. J. L. Hall made a number of very fine flights on his Blériot monoplane from the Redmires Racecourse near Sheffield but met with a mishap on Friday. Mr. Hall was flying in a gusty wind, when the machine side-slipped, and as it was only a short distance from the ground he was unable to regain control of it. The pilot was thrown out and escaped with a severe shaking, but the machine was severely smashed in falling. Earlier in the day Mr. Hall had the novel experience of taking two performing chimpanzees, Hans and Greta, for a short trip round the Aerodrome. On the previous day Mr. Hall had given two good flights although the wind was very strong.

OF THE WEEK.

Cody to Lecture at Dover.

On Tuesday, December 17th, Col. S. F. Cody is paying a visit to Dover and will give a lecture in the Town Hall on "The Progress of Flight during the Past twenty-five years." Through the activity of the Dover Aero Club the town takes a great interest in aviation matters and the lecture is sure to attract a good audience so that early applications for tickets is desirable. They can be obtained from Capt. Marley, Secretary, Dover Aero Club.

Work on the Dunne.

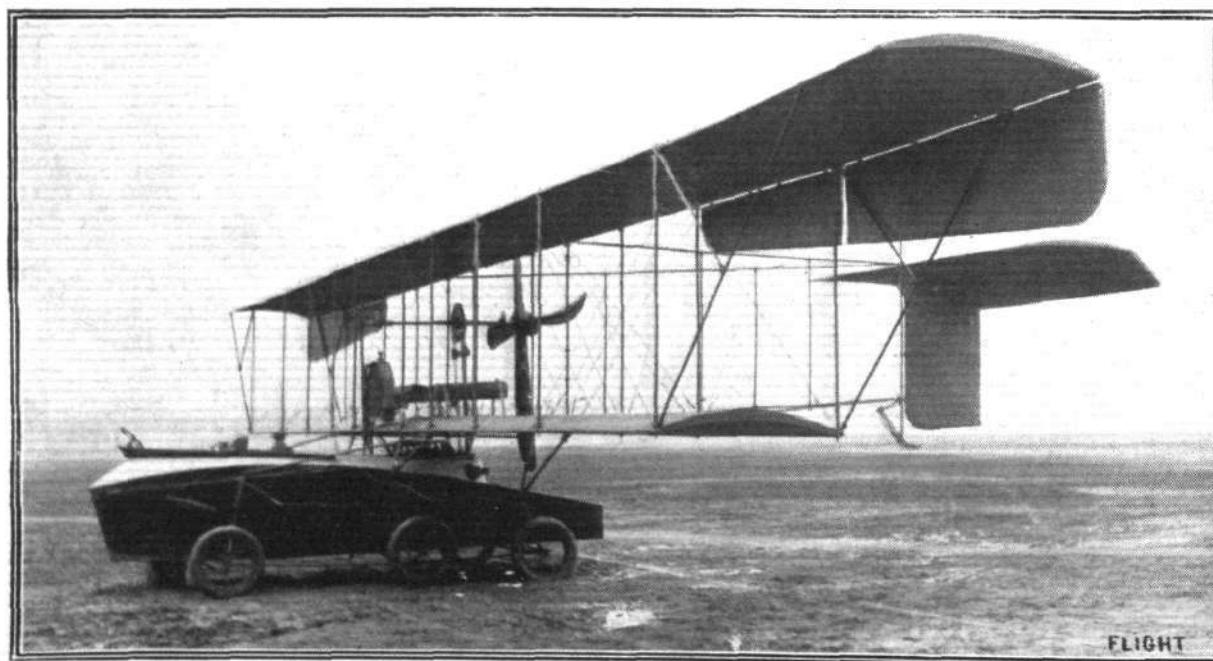
MR. PERCIVAL, lately, has done much commendable flying on the Dunne automatic stability biplane on Salisbury Plain. A point that, accidentally, was not included in our last week's issue was that he had flown over, on the 16th, to the Central Flying School at Upavon from Lark Hill, reaching *en route* an altitude of 1,500 ft., and descending there by a particularly well-executed spiral *vol plané*. He returned to his dépôt later on in the day.

Col. Cody Goes a Hunting.

ON Saturday, Col. Cody enjoyed the novel experience of attending a Meet of the Aldershot Beagles at Eelmore Bridge, Laffan's Plain, on the Government Cody biplane. Col. Cody descended quite close to the meeting place, and after a chat with the Master, Capt. Sankey, he remounted his machine and after circling above the hounds, followed the pack for a short distance across the Plain.

A Balloon Adventure.

TWO members of the Royal Aero Club, Mr. Arthur Turner and Mr. Nolan, had a very perilous experience last week. They left the Battersea Gas Works, London, S.W., in a balloon at half-past twelve on the 22nd inst., intending to come down on the South coast. A first landing was made at Buxted, and finding they were some thirty miles from the sea, it was decided to go on further. Shortly afterwards, however, the aeronauts lost their bearings and then found themselves drifting over the sea. Darkness came on, and to add to their difficulties the balloon became so heavy with moisture that do what they would the aeronauts could not prevent it gradually sinking. Fortunately, through the striking of three matches, their position was conveyed to the crew of a fishing smack who picked up both men and also salved the balloon.



FLIGHT

The 200-h.p. "Hydro-aerobus" that has lately been turned out of the Voisin works to the order of M. Henri Deutsch de la Meurthe. Its Clerget motor drives a 4-bladed propeller at 600 revs. per min. It has a wing spread of no less than 74 ft., and has been designed to carry 6 people.

NOVEMBER 30, 1912.



Col. S. F. Cody, on the Cody biplane, flying at the meet of the Aldershot Beagles at Elmwood Bridge, Laffan's Plain.

BRISTOL AND WEST OF ENGLAND AERO CLUB.

CONTINUING the precedents of former years, there was a large and enthusiastic attendance of members and friends at the annual dinner of the Bristol and West of England Aero Club, held at the Clifton Down Hotel, Bristol, on Thursday, November 21st. Sir George White, President of the Club, occupied the Chair, and was supported by the Lord Mayor of Bristol (Alderman C. J. Lowe), and the Sheriff (Mr. T. J. Lennard).

Among the members present were Messrs. J. Weston-Stevens, G. Stanley White, R. Grainger Brunt, F. S. Barnwell, R. Eldon Bush, A. E. Catford, G. B. Dacre, H. G. Doggett, E. H. Desprez, T. W. Egerton, J. R. Palin Evans, C. R. Fry, P. E. Gane, A. V. Hartnell, A. E. Johnson, W. F. Joll, Alan McArthur, Collyns P. Pizey, S. E. Smith, P. J. Smith, H. R. Smith, P. A. Thompson, R. V. Tivy, Edgar Thomas, H. J. Thomas, and A. Alan Jenkins (Hon. Secretary). The visitors included Messrs. Harry R. Busteed, Henri Coanda, R. de Laplane, H. M. Jullerot, Lieut. G. W. Phillips, R.N., Sydney V. Sippe, Arthur E. Stone, F. Farnall Thurstan, and H. E. Townsend.

Mr. H. J. Thomas proposed "The Navy, Army, and the Imperial Forces," Lieut. G. W. Phillips, R.N., responding.

The toast of "The Club" was submitted by the Lord Mayor, who concluded his speech by referring to the world-wide fame which had been acquired by the Bristol machines turned out from the Filton works, of which their President, Sir George White, was the mainspring. Mr. J. Weston-Stevens responded.

Mr. Alan McArthur proposed the toast of "The President," and in replying, Sir George White said he did not hesitate to think that before many years had passed aeroplanes would be used for transport and take a great part in the commerce of the country. Sir George White then went on to tell of the progress of the Bristol Company which, on starting two years ago, had made great strides during the past twelve months, although he had to say it was mostly abroad.

Early in the history of the company he went to the War Office authorities and told them frankly that whilst he had started the company as a commercial undertaking, yet he was also impelled by a patriotic desire to see that England should not lag behind, and, therefore, if the British and Colonial authorities would supply them with orders in sufficient quantities they would undertake not to build for any foreign Powers. The answer he got was that they were buying foreign machines, and should continue to do so whenever they thought proper, and that the Bristol Co. were equally at liberty to supply any country who would take their manufactures. His firm then naturally turned their attention to these other countries, with the result that a number of foreign Powers have been only too glad to avail themselves of Bristol manufactures. Amongst them he mentioned Russia, Germany, Italy, Turkey, Bulgaria, Roumania, and Spain.

Moreover, in the case of Germany, they were cordially invited to start a factory, and had therefore built and equipped both factory and school in Germany. The Italian Government a few months ago sent a Commission abroad to determine the machine they would adopt, not only for their own War Office, but also to enable them to advise the National Patriotic Fund as to the machines to be selected for purchase with the large funds raised by national subscription. As the result of their investigation, and by the experience which they had had of the Bristols in the

war with Turkey, the Italian War Office declared the Bristol monoplane the best aeroplane for military purposes, and, following upon this decision, the National Committee and War Office placed initial orders for Bristols which will run into between 50 and 60 monoplanes as a commencing order. The Company had been pressed by the Russian military authorities to start a factory in Russia, with promises of large orders, and the matter is now receiving anxious consideration. In Roumania they recently demonstrated at the military manoeuvres with such success that opening orders for ten Bristol monoplanes have already been received. During the past twelve months they have turned out at Filton about seventy thousand pounds' worth of machines, of which the British Government had contributed eight thousand pounds only, whilst the orders for other countries for Bristols still unexecuted would probably total ten times the amount of work in hand for our own Government. In fact, the foreign orders are so encouraging that they are increasing their works by again nearly doubling the size of the factory in order to cope with the work. Not only do foreign powers buy Bristols, but they send their officers to Bristol for tuition. They had already taught German, Bulgarian, Chinese, Italian, Turkish, and Spanish officers, and there are half a dozen Roumanian officers at the school on Salisbury Plain learning to fly the monoplane, whilst on December 1st, no fewer than 20 Italian officers arrive for the same purpose. During the past twelve months they have turned out 108 certificated aviators from their schools (of whom 87 are Army and Navy officers) or more pilots than every other school, including Government establishments, put together. At the recent military trials on Salisbury Plain they were awarded £1,000 in prizes, and the authorities purchased the two competing Bristol machines for £2,000. Again, the War Office has recently entrusted the firm with the building of four machines of War Office design, whilst the Admiralty have now come to them with orders, and, in addition, the Australian Government had given them their order. He hoped, therefore, that during the ensuing year we may see a quickening of interest on the part of our British and Colonial authorities, who up to the present are distinctly behind the large Powers and many of the smaller ones. The aeroplane is now acknowledged to be a necessary arm of war, and it behoves our Government to bestir themselves if we are not to be left behind in the great race, for he believed that during the next five years the Powers will call for thousands, if not tens of thousands, of aeroplanes, and the developments in their use for both military and naval purposes will be startling, and have a far-reaching effect upon the future of warfare, though, in his opinion, the possession of a strong fleet of aeroplanes by any country would, just as it is with a strong Navy, be a dominating influence for peace. He could hardly trust himself to express the opinion which he held as to the future, as some might look upon it as chimerical; but this he could say—Bristol had every reason to be proud of the prominent place in the world of aviation which she had already secured, and that it was the intention of the Bristol Co. to maintain and enhance that position as this wonderful industry progresses throughout the world.

Mr. H. R. Smith proposed the toast of "The Visitors," and the Sheriff replied.

After the dinner an excellent musical entertainment was given.



AIRSHIP AND BALLOON NEWS.

French Military-Built Dirigible.

FOLLOWING the example of the British Army, the French military authorities at Chalais-Meudon have constructed a dirigible which had her first trial on the 22nd inst. She is of the non-rigid type, the envelope being 77 metres long and 12.04 metres diameter at the centre, with a capacity of 6,500 cubic metres. Two propellers are fitted, the power being provided by two Clement-Bayard motors. The airship has been named "Fleurus" in memory of the battle of June 27th, 1794, at which a balloon was employed by the French Army for the first time.

Long Cruise by "Conte."

WITH seven persons on board, the French dirigible, "Conte," left Issy on Saturday morning at 8.50 a.m., and landed at Etampes at 3 o'clock in the afternoon, the greater part of the cruise being carried out at a height of 1,300 metres.

More Delay with Spiess Dirigible.

AFTER many delays it had been expected that the big rigid dirigible built by M. Spiess for presentation to the French Army would make its trials at the end of last week, but they had to

be once more postponed owing to an excessive leakage of gas from two of the ballonetons.

The "Hansa" at Potsdam.

UNTIL the end of the year the Zeppelin dirigible "Hansa" will be stationed at Potsdam whither she cruised on the 19th inst., with ten passengers and a crew of eight on board, the journey of 250 kilometres taking five hours and a quarter.

France Still Ballooning.

IN spite of the great attention paid in France to aviation, ballooning has evidently not lost its attractions, if one may judge by the fact that at the last meeting of the Committee of the Aero Club of France fourteen balloon pilots' certificates were issued, including one to a lady, Mademoiselle Tissot. The number of French balloon pilots' certificates now issued is 294.

Next Year's Gordon-Bennett Balloon Race.

IT has been provisionally decided by the Aero Club of France that next year's balloon race for the Gordon-Bennett Cup will be held on October 12th, and the start will probably take place at the Tuileries, or failing that, either at Vincennes racecourse or Bagatelle.

FOREIGN AVIATION NEWS.

The Gordon-Bennett Aeroplane Race.

ALREADY the Aero Club of France has been giving its attention to the arrangements for next year's race for the Gordon-Bennett Trophy, and although the date will not be officially fixed until the F.A.I. meeting in January, it will probably be some time in July. The contest will be held at Rheims, and the Ae.C.F. has cordially accepted the magnificent offer of M. Armand Deperdussin of an aerodrome and specially erected hangars as well as a sum of 100,000 francs.

Madame de Laroche Flying Again.

GOOD progress is being made by Madame de Laroche in the piloting of her Sommer biplane at Mourmelon, and during the past few days she has made several flights of a quarter of an hour's duration. She appears to have entirely recovered from the effects of her accident at Rheims in July, 1910, and flies her machine with complete assurance.

Collecting Subscriptions by Aeroplane.

IT having been decided by a number of aviators to join together in sending a wreath to the funeral of their comrade Andre Frey, Guillaux on his Clement-Bayard monoplane started from Issy on Sunday and paid a round of visits to Villacoublay, Buc, St. Cyr, &c., in order to collect subscriptions. Before landing at Issy again he flew over the Parc des Princes track while the Aviette Competition was in progress.

Garros Goes to Tunis.

ON Wednesday, Garros, with his Blériot monoplane, left France for Tunis where he intends to make an attempt to regain the height record.

A Long Flight by Vedrines.

BY way of practice for a big exploit which he has in hand Jules Vedrines on Saturday started from the Deperdussin School at Etampes and flew to Angers. There was a heavy mist at the time but he made the journey of 280 kilometres in two hours and a half.

Farman Brothers at Buc.

ON Saturday last at Buc Henry Farman was testing a new machine and took his brother Maurice for a trip on it, after which the latter was seen flying one of the Henry Farman type biplane.

Long Flights on Caudrons.

LIEUTS. PERALDA AND GERARD made several extended flights over the Bay of the Somme and the neighbourhood on their Caudron machines on Saturday last, and Sapper De Loche made a trip over the course Crottoy—Berck—Montreuil—Crecy—Abbeville, and Crottoy, this being by way of practice for his military certificate tests.

Two Hours on an Astra.

AT Villacoublay on the 19th inst., Montmain was flying a 70-h.p. Astra biplane for a couple of hours. During the past few days he has made several flights round the country and has also taken up a great number of passengers.

Testing a High Flyer.

BRINDEJONC des Moulinais demonstrated at Villacoublay on the 21st inst. before Capt. Des touches, the Morane Saulnier monoplane on which Legagneux recently beat the height record.

With a load of 135 kilogs. the machine got off the ground in 42 metres and climbed 1,000 metres in 4 mins. 45 secs. Although the machine was only fitted with a 50-h.p. Gnome engine it attained a speed of 114 k.p.h.

Good Work at the Borel School.

AT the Borel school at Buc on the 21st inst., Lieut. Ragot made a flight of an hour's duration, and on the previous day he flew to Juvisy and back through the rain. Lieuts. Ronin and Garnier and Serjeant Pinsard each made one hour flights on the 21st.

Fine Flying at R.E.P. School.

LIEUT. Campagne made a very fine flight with two passengers on his R.E.P. monoplane over and around Buc on the 21st inst., and Lieuts. Geibel and Bruguiere each on a R.E.P. monoplane were flying in company for over an hour. A couple of days previously Molla also made a flight of an hour on his R.E.P.

A Donnet-Leveque Over Paris.

BY way of testing a Donnet-Leveque hydro-aeroplane ordered by Mr. Jones, of the Whitehead Torpedo Works, of Fiume, Austria, Andre Beaumont, on the 22nd inst., rose from the Seine in front of the Donnet-Leveque works at Bezons, and following the course of the river, flew to Paris. Turning over the Grand Palais, he then made his way back to Bezons. He was accompanied by the Austrian pilot, Koenig, who is learning to fly the machine.

Hydro-aeroplanes at Trier.

ON a Brouckere (Belgian-built Deperdussin) hydro-aeroplane, with 100-h.p. Gnome motor, Lavrens, on the 22nd inst., made a fine flight from Trier, where he is now making his headquarters. He flew over the valley of the Seine from Meulan to Poissy, and had no difficulty in alighting, although the speed of his machine is said to be 100-k.p.h.

An English Pilot at Farman School.

ON the 19th Capt. Mellor, after only a brief period of tuition at the Farman school at Etampes, passed the tests for his brevet in brilliant fashion. Lemaitre, another pupil, also qualified on the same

day, and non-commissioned officer Corbeil finished his apprenticeship with a trip of an hour and a half at a height of 400 metres, landing by a fine *vol plane*.

A Try for the Criterium.

ON Monday, at Etampes, Fischer, on a Farman machine with Rhone motor, started off at 6.45 a.m. in a trial for the Ae.C.F. Criterium for the longest flight over a closed circuit. After flying for two hours at a speed of 82 k.p.h., he decided to stop and make some adjustments to his machine. He will make another attempt as soon as possible.

Buc to Chalons on a Farman.

LIEUT. VARCIN, accompanied by his mechanic, flew from Buc to Chalons on his Maurice Farman biplane in splendid style on Monday. A brief stop was made at Meaux.

Another Train Military Pilot.

ON a Train-Gnome military monoplane, Labarre, on Monday, completed his tests for a French superior certificate, flying over a course from Mourmelon to Villacoublay and back.

Flight "Man-Birds."—VII.

—From the original by Frank M. Williamson.



THE GAME-FOWL.

The Deutsch Aero Yacht Flies.

WITH Rugere at the wheel, the hydro-aeroplane built by M. Gabriel Voisin for M. Deutsch de la Meurthe was tested at Issy on Saturday last. With six passengers and a pilot on board it rose from the ground in 70 yds., but in landing the chassis was somewhat buckled. It is said that the machine, which is fitted with a 200-h.p. Clerget motor driving a four-bladed propeller, attained a speed of 110 k.p.h. The span is 22'5 metres and the length 12 metres.

Honour for M. Deutsch de la Meurthe.

THE French Government has not been slow to recognise the public service of M. Henry Deutsch de la Meurthe in his liberal support of aeronautics and it is announced that his name has been put forward as a Commander of the Legion of Honour. M. Deutsche has given the French Nation the Aero-Technique Institute at St. Cyr; some years ago he presented a dirigible to the French Army and he has supported the aeroplane industry by giving commissions to the various constructors. The limousine built by M. Blériot, as well as its immediate predecessor will be remembered, while his latest purchase is the hydro-aeroplane for six or seven passengers, which has been built by M. Gabriel Voisin and is illustrated elsewhere in this issue.

A Caudron Quartette in the Air.

ON the 22nd inst., a quartette of Caudron machines were seen flying along the French coast in the neighbourhood of Crotoy. The pilots were Lieuts. Peralda and Gerard, Rene Caudron (with Madame Peralda), and Gaston Caudron (with Madame Gerard). Altogether a distance of about 150 kilometres was covered during the day.

A Deperdussin Escadrille in Flight.

SIX 50-h.p. Gnome Deperdussins, piloted by Lieut. Brocard, Lalanne, Radisson, Dietrich, Rochette, and Sergt. Verdier, started from Rheims in the afternoon of the 20th inst., and flying high, owing to the strong wind which was blowing, they successfully made their way in company to Maubeuge, the journey of 130 kiloms. taking 2 hours.

French Military Aviator Killed.

A FATAL accident occurred at Etampes, on the 21st inst., to

Sergt. Laurent. He had made several flights on his monoplane, and in the last one he made a sharp turn, so that the machine apparently overbanked and dropped to the ground. The passenger was thrown out and escaped with a few bruises, but the pilot died from his injuries very shortly afterwards.

The Fatal Accident to Frey.

THROUGH the fatal accident which befell Frey while flying his monoplane at Rheims on the 21st inst., France has lost one of her ablest pilots. He obtained his certificate on a Sommer biplane on June 10th, 1910, and has since flown various types of both monoplane and biplane. Last year he was placed third in the Paris to Rome race and was the only competitor to attempt the stage from Rome to Turin during which he met with a very serious accident, while crossing the Appenines at Ronciglione, which put him out of flying for many months. This year he qualified as one of the three representatives of France in the Gordon-Bennett Competition, and in the course of his eliminating trial beat the speed records with one passenger. Frey had been undergoing a period of instruction as a sapper in the Reserve, and each day had flown over to the Military Aerodrome at Rheims from the Hanriot School on the 100-h.p. monoplane, on which Bielovucic had made some 250 flights. In the afternoon of the 21st, he started for a trip on the machine against the advice of his friends, the air being in a very disturbed condition. He was at a height of 50 metres, when the machine ran into a very bad *remous*, and dived. The pilot apparently thought that the machine would recover itself, and hesitated too long before attempting to get it under control again. It crashed to the ground, and the pilot was instantly killed. A military commission immediately examined the débris of the machine, and found all the controls, &c., intact, so that there appears to be no doubt that the cause was as mentioned above.

The Aviettes still Unsuccessful.

OF the large number of entrants for the prizes offered by M. Peugeot for a human flight only 17 put in an appearance at the Parc des Princes track, Paris, for the trials on Sunday last. Of these none succeeded in flying the ten metres necessary to gain the prize of £400 or even five metres for the prize of £80. Among the interested spectators was Mr. Henry Farman.



The coque of the Voisin hydro-aerobus, as seen from behind. Incidentally it may be noticed that the landing gear does not seem any too happy.

Military Aviation in Austria.

THE Austrian army at present possesses two aerodromes—one at Weiner Neustadt, which is about 50 kiloms. from Vienna, and the other at Goriz, which is north of Venice. The Etrich and Autoplan firms have also started a new aerodrome at Aspern. At the present time about 70 officers have qualified for their *brevets*, and the present system is that each officer has a year's training and then returns to his regiment. The constructors, Illner, Hierominus, and Von Pischoff, are officers in the reserve. There are only three Austrian machines which have attained any degree of prominence, these being the Etrich monoplane, the Lohner biplane, and the Autoplan hydro-aeroplane; while there are two Austrian engines which have attained some success, the Austrian-Daimler and the Hierominus.

The Italian Naval Station.

GOOD progress is being made with the hydro-aeroplane

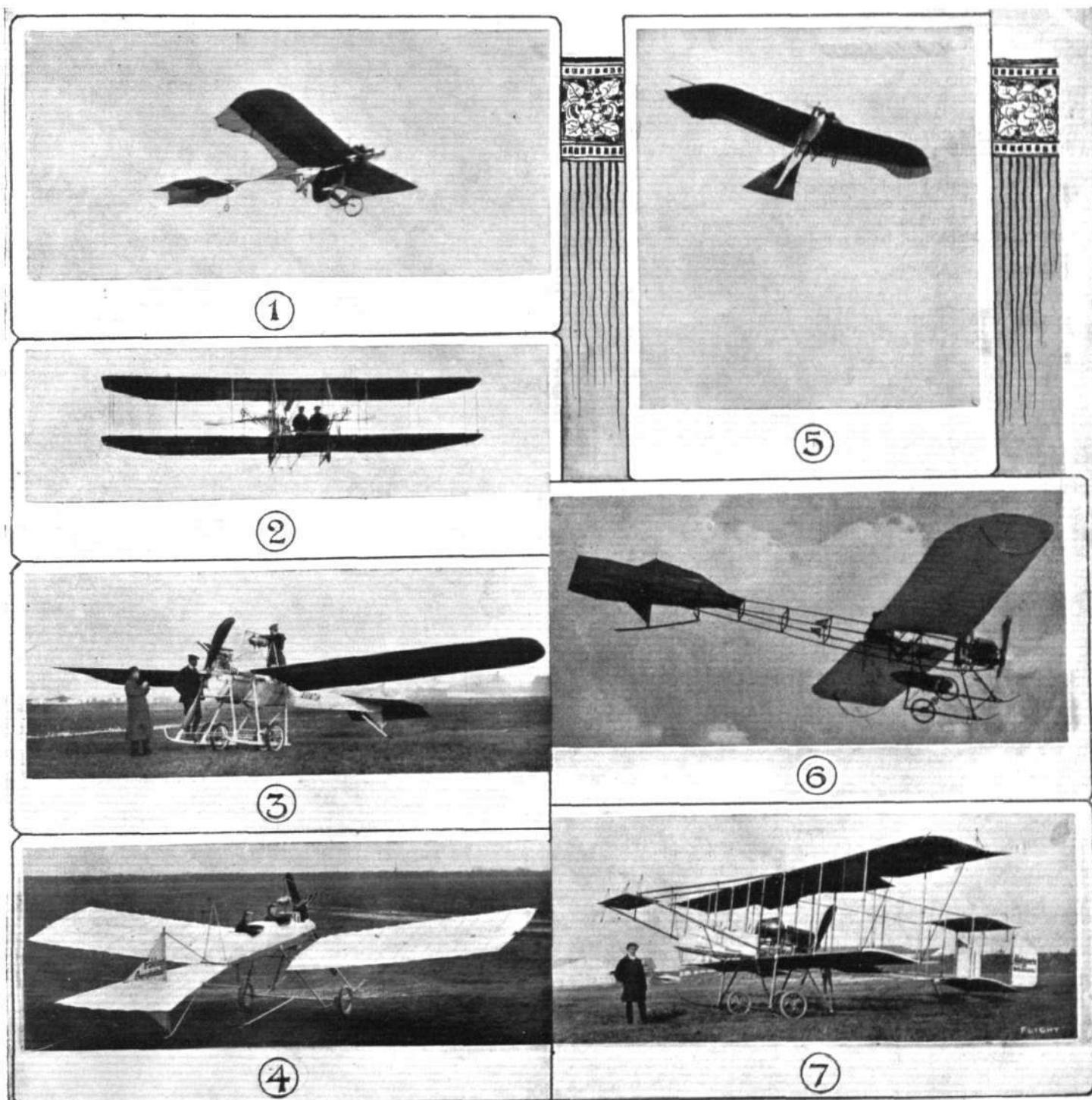
station which the Italian Government is establishing at Venice. Commander Ginocchio will be in charge, and in addition to Lieut. Calderara, to whom we referred last week, his assistants will include Lieuts. Garrassini and Roberti, both of whom saw active service in Tripoli. Six machines have been purchased in France for the station.

Flying in Argentina.

ON Monday last Mr. Newberry, on his Blériot-Gnome, flew across the Rio de la Plata, between Argentina and Uruguay, in 37 mins., and made the return journey, *via* Palomar, to Buenos Ayres in 53 mins. The total distance covered was 150 kiloms.

Aeroplanes at Japanese Review.

AT the conclusion of the recent Japanese Naval Manœuvres a naval officer, Kaneko, piloted a Maurice Farman biplane over the fleet, which was composed of about sixty warships. The flight was watched with great interest by the Emperor.



A series of German aeroplanes at Johannisthal from photographs kindly sent to us by the Hon. Lady Shelley.—1. Grade monoplane. 2. German Wright biplane. 3. Jeannins monoplane. 4. Fokker machine. 5. Rumpler-Taube in flight. 6. Harlan monoplane. 7. Albatross biplane.

Models

Edited by V. E. JOHNSON, M.A.

Aero Exhibition, Olympia. Model Section.**Class II. Models Driven by any Other Power.**

THE wording of this class again appears to be a little unfortunate, but taken in conjunction with Class I, what it really means is models fitted with a rubber or spring motor. Since weight for weight about six times as much energy can be got from rubber as from any form of steel spring, this class really signifies rubber-driven models. It is divided into two sections—(a) rising from the ground or self-launching models; (b) hand launched. With regard to the former the minimum weight is 8 ozs., the qualifying duration 30 secs., design and construction receives 50 marks, flight duration 50, stability 50. We repeat the above here because it is absolutely necessary that competitors should keep all these points prominently before them when designing and constructing the model—to which, it should be noted, there is no maximum weight limit.

The difference between the conditions here to be fulfilled and those asked for in the "Wakefield" competition should be carefully noted. In the latter the tests were (1) shortest run before rising, (2) duration of flight, (3) stability; marks: 50 for test 1; 100 for test 2; 50 for test 3. Here we have a premium set on duration, and a quite unimportant factor, viz., shortest run before rising given a very prominent place.

In the forthcoming competitions the premium is set not on duration, but on a model scientifically designed right through; a model also which will be expected to show a certain amount of

It is true there is no separate class, but that is no reason why they should not compete. It is certainly not an impracticable achievement, the building of a tractorplane with a minimum weight of 8 ozs., which shall make a duration of over 30 secs. It may be difficult, but as a matter of fact we know personally of two instances in which it has been done.

Let us suppose the machine to be one with a single propeller, the ordinary duration can be considerably increased by the use of a geared motor, using two cogs of the same number of teeth, one on the propeller-shaft the other running in mesh with it, the cogs used should have as small a diameter as possible, owing to the rubber carrying hooks turning in opposite directions, they can turn quite close together, and even if the rubber motors touch they do not interfere with one another, most machines we have seen have been fitted with gear wheels about three times the size they need be.

We saw at Messrs. J. Bonn and Co. a few days ago some cog-wheels excellent for the purpose, very strong and very light and with broad and deep teeth, an essential feature. Vaseline should be used as a lubricant for the cogwheels, but see none gets on your rubber. Use oil for the bearings.

One great advantage that a geared motor of this description possesses is that, the torque of the two rubber motors being opposite in direction and equal in amount (the same amount of rubber being employed on each motor), the twisting action on the tail is entirely done away with; and it is this very twisting action which has brought to grief many experimenters with this type of model. The rubber can be carried the full length of the fuselage, which can be covered in; in fact, an almost scale-like model can be constructed on these lines, save that the fuselage will be longer than that employed in the case of present day full-sized tractors. The position of the planes will also be somewhat different, being nearer the tail.

Those competitors who favour the well-known loaded-elevator type of model will undoubtedly be expected to show something of a practical character in the design of their chassis, i.e., a type of chassis which could (suitably modified) be applied to full-sized



Mr. F. W. Jannaway and three of his models.

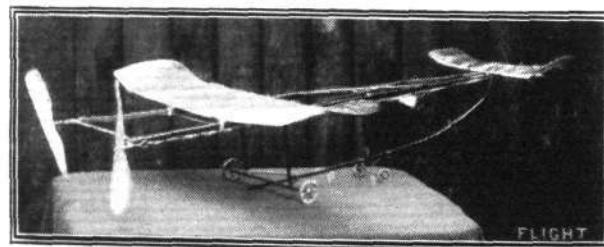
detail, and not be a mere flying stick on wheels. For instance, a model in which the only connexion between the elevator and main plane is the stick carrying the rubber motor or motors is likely to receive but scant attention at the hands of the judges.

The increase of the weight from 4 to 8 ozs. in the Wakefield competition had the effect not so much of increasing the span of the four-ouncers as (generally speaking) of turning them from monoplanes into biplanes. The chief reason being that aeromodellists were thereby enabled to obtain by this means sufficient lifting surface to enable them to carry the increased weight, without departing from their previous wire framework for the wings, which in models of a certain size and span has been found to give such excellent results. We shall certainly, however, expect to see at Olympia, even in this class, some models with properly built-up wings, double surfaced, &c.

The design and construction of the landing chassis is also one to which especial attention should be paid; everything wherever possible should also be of streamline form. The gliding angle of the model, and the construction and kind of propeller or propellers employed, require special attention.

The competitor should also carefully bear in mind that a single-propeller-driven model showing equally good stability, &c., as a twin-propeller machine is distinctly its superior.

Several correspondents have written pointing out that there is no separate class for tractors, and that they are therefore out of the running; we do not agree with them for the following reasons:—



Mr. F. W. Jannaway's R.O.G. model.

design. The majority of such models as generally flown most certainly could not. It would, in our opinion, be the greatest mistake to lay too much stress on duration—provided you can accomplish 35 to 40 seconds we do not think you need trouble about much else in this direction.

There still remains other types of models to be considered—for instance, the tail type twin propeller model, the propellers being placed behind the tail; and the tail type model in which the propeller or propellers are in the rear of the main planes.

The last named type offers great constructional difficulties so far as the motor is concerned, it being almost impossible to design a form of rubber motor which should give the necessary qualifying 30 seconds duration and fit in with the general design of the machine. With regard to the former this is a model which has been very highly developed so far as duration is concerned by certain experts—the best known probably being the present official record holder, Mr. A. F. Houlberg. Before deciding on such a type of model as this, however, the designer would do well to carefully consider how such a design could be applied in full-sized practice, in which the distribution of weight is so very different, and how far it would require modification to be so applied. The foregoing by no means exhausts all the types that would be considered, but we think sufficient has been said to give some indication of the lines along which the competitor should proceed. Above all, avoid building a flying stick on wheels—it will stand no chance.

To anyone who is not an expert, we should most strongly advise

the building of two models—the first one for practice, for testing, and for experiment, and from the knowledge so gained then build the actual machine intended for exhibition.

Turning now to (b), hand-launched models, minimum weight 4 oz., we sincerely trust that this will not degenerate into a mere flying-stick competition.

Design and construction still score 50 marks and stability 50. With regard to the latter, the A frame twin-propeller model owing often (not always) to its speed and the absence of all gyroscopic effect exhibits, or to an ordinary observer would appear to exhibit, whilst actually flying in the air, a really remarkable stability even when flying in a gale, when, however, the power has run out, even in all absence of wind, the glide to earth is, alas, too often chiefly conspicuous by its absence; here again a single propeller slower flying model exhibiting good stability throughout would be certain to score. A geared motor similar to the one already described can be used in this case as well. It has a decided steady effect on the model and enables the designer to approximate closer to the actual dimensions (total span to length ratio) employed in full-sized design.

N.B.—All models exhibited at Olympia must be fitted with a suitable and proper protector.

Mr. F. W. Jannaway's Models.

We give this week two illustrations of the above. Mr. Jannaway is one of London's most enthusiastic amateur aeromodellers (not of the flying-stick type), and his work certainly deserves every encouragement. The following are the chief particulars:—

Fig. 1. R.o.g. model.—Main plane span 28 ins., chord 6 ins.; elevator span 8 ins., chord 3 ins.; "A" frame 38 ins. long, with a strong chassis and skid; propellers (twin) 8 ins. diam., 16·5 ins. pitch; total weight of machine 9 oz.; total weight of rubber 2½ ozs. In the Gamage Cup competition this model flew 1,000 ft., and in the amateur off-the-ground, the duration was 39 secs., with a run of 3 ft. 9 ins.; awarded second place. For some time this model also held the official r.o.g. distance record.

Fig. 2. Single-screw tractor plane (the one Mr. Jannaway is holding).—Length 36 ins., span 24 ins., chord of plane 5 ins.; tail 8 ins. by 6 ins., fan-shaped; propeller diam. 10 ins.; total weight



KITE AND MODEL AEROPLANE ASSOCIATION. Official Notices.

British Model Records.

	Distance	Duration	
Hand-launched	... A. E. Woollard	... 477 yards.	
	{ Duration	... A. F. Houlberg	... 89 secs.
Off ground	... { Distance	... G. Rowlands...	... 232 yards.
	{ Duration	... A. F. Houlberg	... 51 secs.
Hydro, off water	... Duration	... G. P. Bragg-Smith	... 25 secs.
Single-tractor screw,	{ Distance	... H. R. Weston	... 84 yards.
hand-launched	{ Duration	... F. W. Jannaway	... 22 secs.

Next Official Trials.—The next official trials will, by the invitation of the Northern Branch Aero Models Association, take place on their ground on Saturday, December 14th. All entries for these trials to be made on the official forms (which can be had on application), and should be sent in at once.

27, Victory Road, Wimbledon.

W. H. AKERHURST, Hon. Sec.



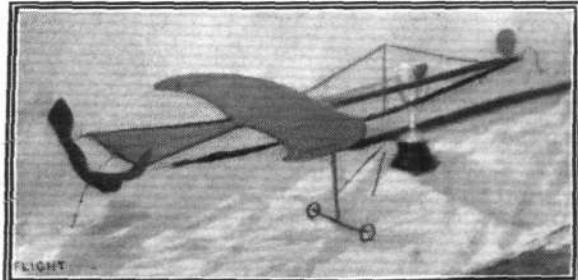
MODEL CLUB DIARY AND REPORTS.

CLUB reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Aero-Models Assoc. (N. Branch) (15, HIGHGATE AVENUE, N.).

NOVEMBER 30TH. The duration competition for month, at Finchley; prize of goods value 3s. 6d. December 14th. The K. and M.A.A.'s monthly trials for records, Finchley. December 21st. R.o.g. contest combined with speed. Time taken for model from time of release till it crosses a line 150 yards down wind. Prizes: 1st, Trophy value 10s.; 2nd, Goods or prize value 5s. Both above prizes kindly presented by Mr. G. Pidsley. December 28th. Monthly duration competition (as November 30th).

Monthly Report.—Work during October chiefly consisted of experimental tests for the "Enfield" challenge trophy. Also the tractor record, previously held by F. J. Hindsley, with 23 secs., was raised to 35 secs. by B. Brown, on October 5th. The contest for the "Enfield" challenge trophy was run off on November 2nd.



The Aero Models Association, Northern Branch.—
Mr. Fletcher's model.

6½ ozs.; weight of rubber 1½ ozs. Won bronze medal K. and M.A.A. competition. At present holds the official record for tractors, with a flight of 22 secs.

Hydro-Aeroplane Model.—Length, 36 ins.; span, 22 ins.; chord of plane, 4·5 ins.; elevator, 8 ins. by 2·25 ins.; propellers, twin, 8 ins.; 16·5 ins. pitch; total weight of machine with rubber and floats 10 ozs. Front float, 8 ins. by 2 ins. by 2 ins. Main floats, 12 ins. by 2 ins. by 2 ins., built up of veneer wood silked over and varnished. Weight of rubber, 2½ ozs. Placed 6th in the second hydro aeroplane competition at Hendon.

Model Club for South-East London.

Mr. A. B. Clark (Rochester House, 196, Brockley Road, Brockley, S.E.), a well-known aeromodeller, having (during the past few months) been frequently asked to organise another model club for south-east London, and having resigned his connection with the Blackheath Club, will be glad to hear from anyone interested in scientific aero-model work in south-east London with a view to forming a club in which the flying stick will not be encouraged, although it will not be banned. The chief aim in the new club will be to give every possible encouragement to the more scientific side of model aeroplaning. There is undoubtedly room for such a club always provided that it adheres at all costs to its original intention.

Query.

We reprint Mr. C. J. Temperley's query, inserted some weeks ago, to which as yet not a single reply has been received. We might just add that a good reply would form an excellent subject for a FLIGHT prize and certificate of merit. The query was as follows:—(1) The ratio of lifting surface to weight. (2) Surface to weight of rubber. (3) To thrust or pitch or diameter of propeller. (4) Total weight of machine to weight of rubber. R.O.G. model.

Replies in Brief.

J. E. ROGERS.—The pressure on our space precludes us doing as you suggest as a rule, but when possible we will do so. We will make use of your communication later on.

H. R. HONEYBONE.—The sketch which you send is not clear, for instance, the elevator appears totally unfastened at its trailing edge.



Models were required to rise from ground, and the results were based on the formula:

Duration (secs.) × wt. of machine (oz.)
Wt. of rubber (oz.)

Very fair weather conditions prevailed, and the contest was made highly successful by the strong turn-out of members and friends. Result: H. E. Fletcher, 49 secs.; points scored, 163·3. Particulars of machine: Monoplane non-lifting tail-behind type; weight of model, 6 ozs. (flying order); weight of rubber, 1·8 ozs., 9 strands of ¼ strip. Machine rose smoothly after a run of 14 ft., the climbing angle being good. Average maximum height attained about 50-60 ft.; speed moderately fast. Machine landed nicely on lightly-slung chassis, after a good glide. Stability exceedingly good. Following closely upon Mr. Fletcher were the points gained, respectively, by E. R. Jones and G. O. Partridge, viz., 157·5 and 155·8. Note-worthy flights were made by Mr. Hindsley's biplane and Messrs. Rogers' and McBirnie's models—both of which were, however, smashed. Messrs. Alfred B. E. Cheeseman and B. Brown ably officiated and carried out the judging. Every Saturday has seen a good attendance of members, and of late flying has taken rather a unique form in the way of illuminated flying. Very successful flights have been accomplished by M. B. Ross and H. E. Fletcher, with fireworks attached or a small oil lamp. When dark, such flights are distinctly spectacular—one particularly so, viz., that provided by the continued explosion of a "jumping cracker" in the air. However, this does not in any way interfere with the stability of the model. On Wednesday, 20th inst., B. Brown raised his previous tractor record of 35 secs. to 39 secs.

Brighton and District ("KINGSLEIGH," KINGSWAY, HOVE).

Monthly Report.—There has not been much outdoor work done during the month. Now that the winter session has started, members spend most of their time in the workshops, and expect to get some good machines out by the new year. The inclination now is to make paper gliders and then to produce larger machines on the same lines; the Weiss type being much in vogue. A. C. von Wichmann and Kerruish are still experimenting with hydrods, and Kerruish has some new and very effective floats on his tractor machine; they are a sort of flattened out cylinders with a point each end. The sec. will be pleased to hear of any new members. Note that the subscription of all those joining now will last till the end of 1913.

Bristol and West of England (Model Section) (3, ROYAL YORK CRESCENT, CLIFTON).

Monthly Report.—No competitions have been held during the month, but a number of new machines have been tested. Self-rising tractor and tail-first models are now in vogue, and hand-launched models are dying a natural death here as elsewhere. R.F.G. models of Messrs. Smallcombe and Martin have flown long distances at heights of 15 and 20 ft. Mr. Stephens' single screw model has made short flights, but might do better with larger propeller, smaller wings, and perhaps gearing; *vide* experiments with similar machines by other members. Mr. Howse's "Weiss" type machine made its debut by rising and flying 450 ft. at a height of 20 ft. without any adjustments at all. This model has wings with a heavy camber at the body, damping out towards the tips which are flat and at a slight negative angle. The rear edge of the wing is flexible, and they are brought back as in the Keith-Weiss aviette. The model is of the T-1-1 floating tail type. This machine possesses the extraordinary stability which is associated with the Weiss gliders, coupled with unusual efficiency, as it is driven by about one-eighth its weight of elastic and yet has a good reserve of power for climbing. This efficiency may be due to the promotion of a regular flow of air similar to that over a soaring bird's wing. This method of obtaining stability is apparently superior to the dihedral angle method which involves an undulating flight path and rolling after an encounter with forward and sideways gusts. Model clubs would do well to experiment with machines of this type which looks decidedly like the type of the future.

Croydon and District Aero Club (Sec., 136A, HIGH STREET).

Monthly Report.—The class of model turned out by members of this club steadily improves, but owing to the finer workmanship and greater care required for scale model type, and the more scientific type of "flyer," the number turned out has not been great. However, several very fine scale models have been made, and they will all fly a short distance. Those members who cannot tear themselves away from the long distance model, have made models to fly with less power, which fly quite as well as the "highly powered dart" if properly designed and head resistance cut down as much as possible. Mr. W. Bell has been notably successful with his model of this type. Mr. P. Hart has made a large rise-off monoplane which will fly between 200 and 300 yds. with astonishingly little power. This model has Caudron type planes and is very stable. Mr. D. Pavely's Nieuport type model (scale) has made several flights of about 60 and 70 yds. Mr. C. Smither's Martin-Handasdye (29 ozs.) has also flown for a short distance, but great difficulty is experienced in getting the right elevation for this model. With smaller models Messrs. Thumwood (tractor mono.), Carter (tractor mono.), Hart (tractor mono.), Pavely (tractor mono.), and Finnigan (tractor), have all had good results, and much has been learnt from these small tractor models. Mr. H. Smither (the club's late secretary) has moved to East Grinstead on business, and will be very glad to hear from any model enthusiasts in that district. Mr. P. Hart has acted as secretary during his absence, but in the future the club's management will be undertaken by Mr. P. Hart and D. Pavely, who will be glad to hear from anyone desirous of joining the club.

Ecclesall and District (247, SPRINGVALE ROAD, SHEFFIELD).

Monthly Report.—At a meeting of the club on November 14th, Mr. Mellor handed in his resignation of the post of hon. sec., owing to lack of time. Mr. C. H. Barber was elected to the vacant office, to whom all communications should in future be directed. A number of experiments with hydro-aeroplanes have been carried out. It has been decided to hold a contest on December 26th (Boxing Day), to take the form of an "Aerial Derby," further particulars of which will be published later.

Hendon Model Aero Club (8, MONTAGU ROAD, W. HENDON).

NOVEMBER 30TH. Best all-round flight contest. December 1st. Duration contest for biplanes only.

Monthly Report.—Some excellent flying has been done, and the number of spectators at the week-end meetings is rapidly increasing. Mr. Short has raised the club's duration record to 56 secs., and Mr. Lawrence has put the distance record up to 318 yards. The duration and best flight trophies were won for the month by Messrs. H. Hills and G. Hedges, respectively. Hayward and Lawrence have both been successful with r.o.g. biplanes. Hedges has not yet had an opportunity of testing his hydro-aeroplane. Large steam-driven models are being constructed by Short (biplane) and Hedges (mono.). Messrs. Mitchell, Brown, Barton, Dodge and Warwick have been flying their usual types of models. It is pleasing to note that the 1-1-Pz type is gradually going out of fashion, and more tractors, biplanes and tailed monos, are now seen on the flying ground. The club room, situated at No. 2, Algernon Terrace, Station Road, is now at the disposal of members. To avoid confusion, it should be noted that this club is totally unconnected with any other in this district.

Leytonstone and Districts Aero Club (64, LEYSPRING ROAD).

NOVEMBER 30TH and December 1st, flying Wanstead Flats as usual.

Monthly Report.—During this month there have been eight meetings, with a good display of models at each. The work of the club at present, however, seems to be mostly elementary, in that a good many of the new members before joining the club had never seen a model aeroplane, so the usual types of flying stick are in the majority at the week-end meetings. Messrs. H. Bedford and F. E. Grattan have been doing fairly well with their single tractors, but the weather has been rather unfavourable for this type of model. Mr. H. Bedford has also constructed a monoplane (1-1-0-21) fitted with floats, but on the occasion of its trial it refused to leave the surface of the water. Mr. G. Hawthorn obtained a 3rd class certificate for duration with 34 secs., and Messrs. S. Booth, F. Hawthorn, H. Green, F. Hancock and others have all been putting in good work. Everybody is enthusiastic, so it is anticipated that fuller and more interesting reports will be forthcoming in the future.

Paddington and Districts (77, SWINDEBY ROAD, WEMBLEY).

Monthly Report.—Throughout the present month the work of members has been almost entirely confined to constructing and testing rise-off models, the natural result of the possession of the excellent rise-off surface of 3-ply wood specially made for the club. The standard of work has thereby been raised, and the durations of rise-off models have improved each week, the principle results being as follows: C. Chalfont, 16 secs.; M. Levy, 14 $\frac{1}{2}$, 20 and 21 secs.; C. Levy, 33 $\frac{1}{2}$ secs., being club record to date; W. Evans, 12, 12 $\frac{1}{2}$, 14, and 18 $\frac{1}{2}$ secs., with 4 ft. 8-oz. monoplane. This model has just been rebuilt, and is now a biplane with staggered planes, rising off at the first attempt. With hand-launched models, Mr. C. Dutton's biplane has made good flights, and Mr. H. Woolley's 12-oz. monoplane, being a reliable flyer, is being used for testing propellers of various types, pitches and blade areas. Mr. T. Carter has been testing models of many sizes and types. H. Weston, Rasmussen, Lane, Davidson, Davey, Bird, and Judd have all done good work. The new clubroom at Stonebridge Park is greatly appreciated by members, and the Saturday evening meetings are fully attended. Lectures and discussions are being arranged for each Saturday

CORRESPONDENCE.

* * * The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

Head Resistance of Aeroplanes.

[1677] In view of the desirability and usefulness of determining the total head resistance of aeroplane machines, and, moreover, of obtaining such data accurately and simply by a practical method—apart from calculation—it has occurred to me as being quite practicable to obtain this important factor, as a whole, including, of course, drift of planes, by suspending the machine head-on in a natural wind, by suitable, sensitively pivoted, pendulous connections from light bridge-bearing structures, or even two pairs of posts forward and aft respectively.

evening during the winter. The club has arranged to exhibit as a club at the forthcoming Aero Show at Olympia, and a local exhibition will probably be held in Harlesden or Wembley immediately after. Details of these exhibitions will be announced later. The present is a good time to join this club, as novices will receive instruction in building reliable models during the winter. For particulars and advantages of membership write to the secretary, W. E. Evans.

Keigate, Redhill and District (8, BRIGHTON ROAD, REDHILL).

Monthly Report.—Despite wicked weather, an immense amount of work has been done. Workshop, fitted up for winter work, in full swing. Tractors doing excellent work. Loaded elevator r.o.g.s doing big distances. J. L. Sutton 210 yds. with 4-oz. r.o.g. W. H. Norton doing good flights with 4-oz. tractor (4-bladed screw), also 8-oz. r.o.g. biplane. W. Key beautiful flights with "baby" models—exquisite workmanship. J. W. Burghope flying frequently with 38-oz. Nieuport. Machine in perfect trim after six months' work. On November 19th flew 100 yds. and made good landing in pouring rain—wet through. Hoyle, Oram and Greenhead flying for certificates; M. and R. Wilson, Bond and Ewen also out. Key, Sutton, Norton and Burghope all with over 500 yds. to their credit. The new FLIGHT is voted A1.

Scottish Ae.S. ("ROCHELLE," LIMESIDE AVENUE, RUTHERGLEN).

NOVEMBER 30TH Tractor competition, Maxwell Park. December 7th. R.o.g. competition, Paisley Racecourse. December 14th. Hydro-aero demonstration, Maxwell Park. December 21st. Monthly competition, Paisley Racecourse.

Monthly Report.—Owing to miserable weather, only two outdoor meetings were held during the past month. On November 2nd, at Paisley Racecourse, attempts on club records were made. Many brilliant flights were put up, but only in the tractor (single) were any new figures established, the club records for this class being: Hand-launched, 16 $\frac{1}{2}$ secs., Mr. J. S. Gordon; Off-ground, 10 $\frac{1}{2}$ secs., also by Mr. Gordon. On November 16th, at Paisley Racecourse, the usual monthly distance and duration competition was held, the chief results being as follows: Mr. W. G. Langlands, 48 $\frac{1}{2}$ secs., 604 ft.; Mr. I. S. Ross, 44 $\frac{1}{2}$ secs.; Mr. J. C. Balder, 29 secs. Mr. J. S. Gordon was testing tractor monoplane, with fair results, using a reverse Levasseur-type screw. Owing to bad weather the two hydro-aero meetings had to be declared off. During the month work has been going on at full speed in the workshop, and many new ideas are only waiting respectable weather to prove that they have been scientifically designed. Many new theories have been given practical shape, and such things as propellers, tractors, hydro floats, hollow spars, and experiments in various sections of fuselage timber are being carried out most exhaustively. The "Johnson" type propeller-testing machine has come in for some really hard work during the month, the members taking full advantage of this unique apparatus for satisfying the discussions which continually arise as to propeller efficiency. New members, particularly from the country districts, have been enrolled, and others are urgently wanted to augment the membership list.

Scottish Model Records.

Hand-launched	Distance ...	Mr. J. S. Gordon ...	2,006 ft.
		Duration...	Mr. Jas. Myles ...	65 secs.
Off-ground	Distance ...	Mr. Wm. C. Boyd ...	739 ft.
		Duration...	Mr. Wm. C. Boyd ...	33 $\frac{1}{2}$ secs.
Hydro-aeroplane, off water ...		Duration...	Mr. C. F. Arthur ...	21 $\frac{1}{2}$ "
Tractor (single), off ground ...		Duration...	Mr. J. S. Gordon ...	10 $\frac{1}{2}$ "
	hand-launched	Duration...	Mr. J. S. Gordon ...	16 $\frac{1}{2}$ "

Southgate County School Ae.C. (72, NATAL RD., NEW SOUTHGATE).

NOVEMBER 30TH. Tests for r.g. distance competition. December 14th. The r.o.g. distance competition. Prize: "E. E. Brown" monoplane.

Monthly Report.—On October 19th a speed competition was held. Results (for 100 yds.): J. Reed, 12 secs.; A. Herring, 12 secs. Saturday, November 9th, J. Reed and A. Herring both obtained 1,500 ft. An exhibition of models was held in the workshop on Friday, 22nd. Results of workmanship competition were: 1st, F. Ellingham; 2nd, J. Reed.

Windsor Model Aero Club (10, ALMA ROAD, WINDSOR).

NOVEMBER 30TH. Meeting in Home Park.

Monthly Report.—The past month has seen a great change in the design of the models. The members have nearly all mastered the intricacies of the tractor, and the style of flying has improved in consequence. The most notable flights have been those made by S. Barton, E. Dowsett and S. Camm. The two latter have also brought out two tractor hydro-aeroplanes, and have gained much useful experience. Both models have succeeded in rising from the water. A. Eldridge and E. Stanbrook have started on the construction of an engine. F. Camm and Dandridge have been flying a r.o.g. and a biplane. The members are all busy on models for the next exhibition at Olympia, some of which are quite original. Incredible as it may seem, there has not yet been a good wind on a Saturday, and this combined with the short days, has made it impossible to do any gliding.

Yorkshire Ae.C. (Model Sec.) (53, WEST STREET, LEEDS).

NOVEMBER 30TH. Poppy Fields, Beeston.

Monthly Report.—Good work by Whitaker and Hodgson with single-screw tractor, distance 170 and 220 yards; Pease, single-screw monoplane, 200 yards; "quarters" by Mabb and Holmes with twin-screw monoplanes. Secretary testing large biplane, which was underpowered, and got somewhat damaged in a gusty wind. Hodgson is constructing a novel man-carrying glider which he hopes to test before long.

CORRESPONDENCE.

The machine would hang free—but need not move through an appreciable length of arc—while anchored to a dynamometer, or simple spring balance forward, from which the total head resistance could be read off direct.

As the machine would be slung in flying attitude, most of its weight would be sustained on the wind, rendering it more sensitive.

It would not necessarily be mounted for test in the way I have indicated, but I think that way preferable.

The engine would be running, with propeller detached, of course, to give the vibrant condition of wiring system.

The foregoing suggestion contains—I hope and believe—at least the germ of a simple and practically reliable method of testing for total head resistance, and therefore think it worth placing on record.

Filton, Bristol.

SIDNEY H. HOLLAND.

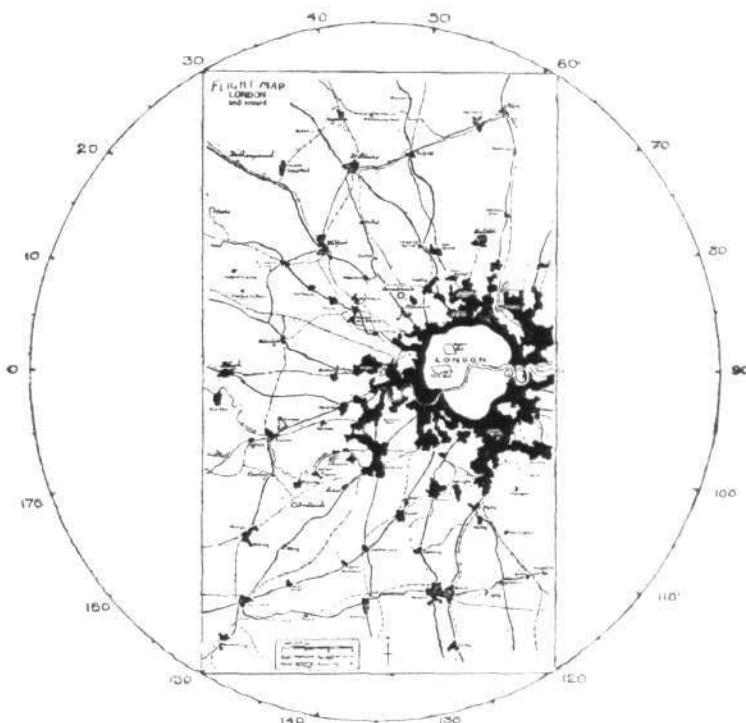
"Flight" Tangent Border Maps.

[1678] With reference to the article on FLIGHT maps in your issue of October 26th, 1912, I enclose a copy and tracing with a view to illustrating the idea of having bearing circles either inscribed in square sections of maps, graduated as shown, or placed loose on the map. The advantage of these circles is that the compass direction between any two points is immediately given by adding the graduation at either end of the cotton or ruler.

Thus, in your tangent map, the direction between Brooklands and Hendon would be $150 + 58 = 208^\circ$ S. 28 W.; and Bletchingley to Leatherhead = $114 + 175 = 289^\circ$ N. 71 W.

If bearings are counted in the new style from 0 to 360, the line is thus found immediately, adding or subtracting 180° as necessary for the opposite direction; thus Leatherhead to Bletchingley would be $289 - 180 = 109$.

It might be worth while to have a circle of convenient size graduated into 180 equal parts, and it could then be placed on a



roll map, which would keep the map open and be a means of obtaining bearings at the same time. For chart work on deck in small craft in bad weather they are useful when there is no room to use parallel rulers.

Of course, if the circles were marked on the maps and charts it would be all the better, if the graduation did not obliterate the other markings too much.

The tangent maps seem very good indeed but would require a good deal of practice to calculate quickly the course or bearing, especially if changing scale or signs of maps.

For laying off a given course or bearing, *i.e.*, performing the opposite operation, for example, laying off N. 45 E. or 45° by the circle method, it is necessary to lay the cotton or ruler roughly at required angle through the point of departure, and then twist it round till the sum of the graduation at either ends give 45.

ROBERT H. KEATE, Commander, R.N.

Fenwick Memorial Fund.

[1679] I shall be much obliged if you will kindly publish this further and final list of subscribers to the above, viz.:—

	<i>L</i>	<i>s.</i>	<i>d.</i>		<i>L</i>	<i>s.</i>	<i>d.</i>
R. C. Annand, Esq. ...	1	1	0	J. D. Lawson, Jun., Esq. ...	1	0	0
E. Birch, Esq. ...	1	1	0	Collected by B. E. ...	2	5	0
T. A. Binks, Esq. ...	0	10	6	Collected by Sympa-			
Mr. and Mrs. Robt. Chapman ...				thiser ...	2	9	0
G. B. H. ...	0	10	6	W. E. Oscar Scott, Esq. ...	0	10	0
Henry Chapman, Jun., Esq. ...				Amount previously acknowledged ...	17	16	0
Miss Beard ...	1	0	0	Total ...	30	15	6
F. E. B. and E. B. ...	0	10	6				

As there is no immediate object to be gained by formally closing the fund, I do not propose to do so. It will therefore remain open

for some time longer, so that no one will be able to say that he has not had ample opportunity of contributing. Subscriptions received by me after this date will not, however, be acknowledged otherwise than by a private communication. The design for the memorial is under consideration, and I have every reason to believe it will be a noble and artistic one in carved oak and bronze. When it is complete, a photograph of it will be sent to each subscriber. My opinion has not changed—that there can be no more fitting subject for a memorial than a man who, after showing the value of his ideas in a concrete form, died before he received the meed of official praise now known to have been due to him, and whose sole reward in this world consisted of the pleasure he took in his work. Had that work been carried on by a direct successor my opinion might have been less emphatic; but we all know that the Mersey Aeroplane Co. and Fenwick died on Salisbury Plain at one and the same moment. I hope, therefore, there are still one or two who will send their mite to the fund.

6, Bessborough Gardens, S.W.

W. R. BINKS.

Shape of Dirigible Balloons (No. 1671).

[1680] Your correspondent, Mr. M. L. Robinson, would find a better comparison if he looks at the shape of the modern Whitehead torpedo.

This is now designed with a blunt nose and attenuated tail, experiment having shown that a greater speed is possible, *i.e.*, a less resistance is encountered with such a design than in the case of the first "Whiteheads" which were designed with a sharply pointed fore-end.

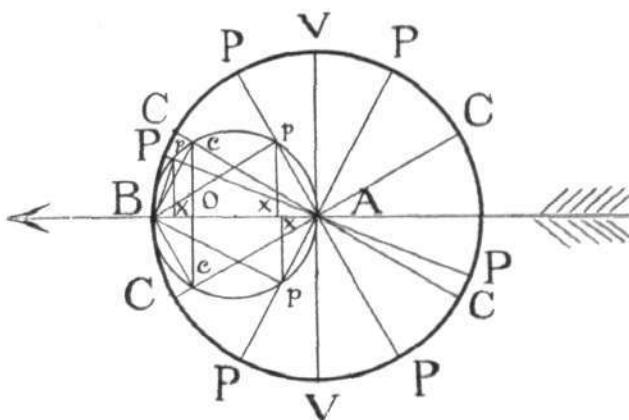
Submarines, it must be borne in mind, do not travel only in a completely submerged state but are built to run at the surface with some small deck space, and were they built with a hemispherical nose this deck would always be awash.

J. R. MACDONALD.

Negative Pressure—Momentum.

[1681] Remarking on the tendency at the present moment to look upon negative pressure as the peculiar attribute of the motion of the air due to the translation of an immersed solid formed like a wing, I thought it would be interesting to know what happened in the case of a circular cylinder moving broadside on, which I remembered was to be found* among those instances where a concrete interpretation of the motion of a solid in an infinite fluid had already been discovered. The result is surprising. If you suppose the motion to have become steady, the equation takes the form $p = \rho v^2 (\frac{1}{2} - 2 \sin^2 \theta)$, leaving out the term due to the atmospheric pressure and the weight of the solid.

By substituting alternately $\sin \theta = 0$, and $\sin \theta = \pm 1$, and putting



p_0 = Greatest positive pressure, $[p_1]$ = Numerically greatest negative pressure, it is found that $\frac{p_1}{p_0} = -3$.

As it may be useful to study the graduation of the pressure I have enclosed a figure which graphically represents the equation. Considered together with the term $\frac{dV}{dt} \cos \theta$, it may also be used to study the effect of the momentum when the velocity varies. The term evidently operates to break into the symmetrical arrangement of the four points (marked C) of zero pressure, causing them to travel round the section, towards the rear when V increases, and towards the front when V decreases. The re-distribution, it will be seen,

* The equation of the pressure at the surface of the cylinder is given in Lamb's Hydrodynamics.

